MARINE REVIEW

VOL. XIX. Published every Thursday at 418-19 Perry-Payne Bldg., by the Marine Review Pub. Co. CLEVELAND, O., MARCH 2, 1899. Entered at Cleveland Postoffice as second class matter. No. 9

ADVANCE IN CONTRACT RATES.

Sixty-five cents per ton has been paid on season contracts for the transportation of iron ore from the head of Lake Superior to Ohio ports. There is no question about transactions at the advanced rate. Several vessels have been chartered and the concern that took them is one of the largest, if not the very largest, in the ore business. This announcement is especially important in view of the fact that the great bulk of the ore business for 1899, probably 12,000,000 gross tons, had previously been covered by lake freight contracts based on a rate of 60 cents a ton from the head of the lakes.

This advancing tendency in lake freights is, of course, in sympathy with the inability of iron and steel manufacturers to cope with the marvelous demands of both foreign and domestic trades. It is further proof that the vessel owners, as well as the ore producers themselves to a large extent, made a mistake in tying up, two months ago, to low prices. Only a few vessel owners will profit by the advance. Their ships are largely engaged on the lower-rate contracts, made when the ore business of the coming season was covered up in a hurry immediately following the announcement of ore prices. But this advance will strengthen the situation as regards ore to be moved on "wild" rates, or the rates made from day to day throughout the season, especially if business in other lines of the lake trade comes up to expectations. Some of the ore shippers claim that the labor situation in the mining region will not admit of any more ore being produced than was gotten out in 1898, except on the Mesabi range. They insist, therefore, that the increase in ore business will not be sufficient to warrant very high lake freights on the part of their product that has not been covered by contracts, but what they fear is a heavy business in grain, coal, lumber and other lines. In vessel circles there is also some fear of boom rates, and a feeling that probably it is well for the general good that so much ore has been covered by contract at moderate figures. High rates, like those of 1895, would certainly prompt the Carnegie company and other big steel and iron concerns not now in the vessel business to go into the building of ships.

TO POOL BARGE INTERESTS ON THE COAST.

As a result of their dealings with the Atlantic Transportation Co. of New York, vesselmen of the lakes have learned something of the coal business on the Atlantic coast between Newport News, New York and Boston, and it would not be surprising to learn of a pooling of interests on the part of owners whose vessels were left in Nova Scotia when the Atlantic company failed. A plan now outlined is to form one strong company, putting several of these vessels and possibly others from the lakes into it, and then send a manager from the lakes to Boston or New York. It is reported that $1.80 a ton is now offered on coal from Newport News to Boston, and this high freight prompts the belief that a profitable trade will be found on the coast for a large number of the medium class of lake vessels for some time to come. The coast ship yards are, of course, crowded just as the lake yards are taxed to their fullest capacity for more than a year.

Capt. John Mitchell of Cleveland and Capt. Ben Boutell of Bay City, Mich., are now in Boston. Capt. Boutell has tugs to sell or charter that could be readily sent to the coast in the spring. Capt. Mitchell is looking after the schooner Fitzpatrick, one of the vessels chartered to the Atlantic company, but for which the Pocahontas coal interests and other coal concerns are now figuring at prices much higher than the figure named in the charter to the Atlantic company. While in the east these two lake vessel owners will give thought to the plan of forming a new company in New York or Boston for the operation of quite a large fleet from the lakes, and if their investigations warrant it, will take the matter up immediately upon their return.

The steamer building for W. A. Hawgood and others at the yard of the Globe Iron Works Co., Cleveland, will be fitted for coast service (she is of dimensions suited to passage down the Welland canal and St. Lawrence river) and will very probably be sent to New York shortly after completion.

William Laird, senior member of the firm of Laird Bros., of Berkenhead, England, whose death was announced a few days ago, belonged to a distinguished family of ship builders. His grandfather is generally credited with having built in 1829 the first iron vessel, a lighter of about 60 feet length. William Laird was born in 1831, so that the great development of iron and steel ship building since the construction of the small lighter referred to, has been almost within his life of three score and eight years.

The battleship building at the works of the Cramps, Philadelphia, for Russia, will be named Retwisan and the cruiser Waryag.

SOUTHERN ENERGY.

IT WAS DISPLAYED IN A REMARKABLE WAY BY THE MANNER IN WHICH THE TRIGG CO. RECOVERED FROM THE EFFECTS OF A FLOOD AT ITS PLANT.

Richmond, Va., March 1. There has been in recent years no better demonstration of the wide-awake, energetic propensities of the men who are making the New South than the manner in which the William R. Trigg Co. of this city has during the past two weeks recovered from the effects of a flood, the counterpart of which Richmond has not known in half a century. The general offices, draughting room, machine shop and several other departments of the Trigg ship building establishment are located in what was formerly known as the Talbot works, a two-story brick structure at the corner of Cary and Seventeenth streets in the eastern part of the city, while the ship yard, with mold loft, sheds for structural work, etc., are located directly on the bank of the James river about a block away. Indeed the location of this latter department is in a new building, which has been erected on a piece of land extending between a slip and the river proper.

Underneath the old Talbott works runs a stream, which, under all ordinary conditions, is of very moderate proportions. On the occasion of the thaw which followed the recent heavy snow, however, this stream was swollen to enormous proportions and developed such force that the floor of the machine shop was literally ripped up in sections and much of the valuable machinery wholly or partially inundated by water. Officials of the company reached their offices in a boat and the water was several feet in depth in the court at the back of the building. Down on the dock the conditions were even worse. An ice gorge on the James river served to complicate the situation there, and the water rose so that the magnificent installation of machinery just made in the ship yard sheds by the Hilles & Jones Co. of Wilmington, Del., was almost totally submerged.

The feature of the whole series of unfortunate circumstances was, however, the wonderfully energetic manner in which President William R. Trigg, Secretary Lilburn T. Myers and other officials of the yard set about reconstructive work as soon as the water had subsided. Indeed the necessity for this will be appreciated when it is remembered that the Trigg company holds contracts with the United States government for five torpedo boats and destroyers which must be completed by Nov. 16. A large force of workmen was set to the task of removing the drifted snow and mud, which had accumulated in the yard, and a still larger force hurried the work of placing a new floor in the machine shop. A hasty examination proved that none of the machinery had been seriously damaged and it was all gotten in running order again with practically no delay.

Your correspondent talked with President Trigg the other day about the matter. Said he: "Oh, it was a thing that could not have been anticipated. It is the first time anything of the kind has occurred in fifty years and the chances are that it will be another fifty years before the experience will be repeated. I do not think it will entail a delay in our work of sufficient proportions to really deserve consideration. Our work is at present confined to the government contracts, but I anticipate that it will be broadened in scope before very long. Indeed we are figuring on several new contracts now. We will of course need to bend every energy to insure the completion of the government work on time, but at the same time there are various ways in which we could be carrying along outside work. As soon as we undertake contracts of this class we will have to increase our machinery installation. The machinery and tools thus far installed have been selected with special reference to the requirements of the torpedo craft work and of course we shall require machines for the other classes of work as well."

Mr. Trigg is now devoting his entire attention to the direction of affairs at the ship yard, although he keeps in touch with matters at the Richmond Locomotive works, with which his name has so long been associated, and which is, by the way, at present enjoying a period of unprecedented prosperity.

The proposed new Baltimore ship yard, with which the name of Mr. H. G. Morse, formerly with the Harlan & Hollingsworth Co., is connected, is very probably the same big project that was talked of in New York some time ago, when Mr. W. I. Babcock of the Chicago Ship Building Co. was mentioned as general manager. Mr. Babcock's friends say he has dropped the eastern negotiations entirely. If the large amount of capital required to "swing this deal" is secured, Baltimore will not get the ship yard, unless through special local effort and inducements to the new company. There is nothing definite as to location.

Mr. William J. Wilson, who has been in charge of the branch hydrographic office at Chicago, and who was recently mustered out of the volunteer navy, has been reappointed nautical expert, and will continue as assistant at the branch hydrographic office. Mr. Wilson has been indefatigable in his work at Chicago, and owing to his efforts the Chicago office is one of the best known in the United States. Mr. Wilson is devoting his spare time to teaching the Chicago ship captains and yachtsmen the navigator's art, being principal of the Chicago Nautical School.—Army and Navy Register.

A report just issued by the American Iron & Steel Association shows a production of 6,609,017 gross tons of Bessemer steel ingots throughout the United States in 1898, against 5,475,315 tons in 1897, an increase of 1,133,702 tons, or over 20 per cent. The production of all kinds of Bessemer steel rails was 1,955,427 gross tons, against a similar production in 1897 of 1,614,399 tons.

TORPEDO BOAT PRACTICE

LIEUTENANT COMMANDER W. W. KIMBALL, U. S. N., COMMANDING THE ATLANTIC TORPEDO BOAT FLOTILLA, PREPARES SOME VERY VALUABLE MEMORANDA RELATIVE TO THE CONSTRUCTION AND EQUIPMENT OF THE TORPEDO BOATS AND DESTROYERS NOW BUILDING—COPIES SUBMITTED TO SUPERVISING CONSTRUCTORS.

The United States Navy department has just submitted to naval officers who are supervising the construction of the torpedo boats or destroyers now building in different ship yards of the country a very valuable compilation of memoranda, chiefly original, prepared by Lieut. Commander William W. Kimball, commanding the Atlantic torpedo boat flotilla. Lieut. Com. Kimball has on numerous occasions demonstrated his entire familiarity with matters pertaining to the construction, repair or equipment of torpedo boats. In view of the large number of vessels of this class now under construction, his suggestions may be accepted as an authorative statement of the practice of the United States navy in this regard. Taking up first matters that will be dealt with by the bureau of steam engineering, Mr. Kimball says:

ENGINES AND BOILERS.

"Exact balance of the main engines cannot be too carefully attended to. Connections should allow either engine to take steam from any boiler, both from main and auxiliary steam piping system. Independent air, feed and circulating pumps are necessary. All the feed pumps, auxiliary and main, should be so connected as to be available for use on any boiler. Bottom blows should be so connected that any boiler may be used for filling any other boiler, for when a tube splits badly or a couple of tubes go at once, the entire feed resources of the boat should be available to save burning tubes or wasting water. Surface blows are desirable, for boiler water will get dirty in spite of all precautions. Fresh water stowage should be as large as the capacity of the boat will allow, for the less make up there has to be when running, the better. It is to be borne in mind that when trimming for fast work it is an easy matter to reduce the weight by emptying tanks.

The evaporating plant should be ample, and there should be two evaporators, so that one may be in use while the other is overhauled. The plant in the Du Pont class is ample. The distilling plant should give 100 gallons hot boiler water an hour from two distillers, so as to make up some when running and when the evaporators cannot work on the condensers because of the vacuum in these last. Condenser heads should have large hand or man holes, so that they can be quickly inspected for and cleaned of grass coming through the strainers without taking off the heads. Condensing surface should be figured for at least water at 85 degrees F. Both steam and water drums of boilers should be fitted with reinforced man hole plates so that plugging tubes can be quickly done, and the delay of coming up a lot of head bolts avoided. The thin steel tubes of the Porter have worn out in the section near the feed. It is my strong impression that thicker charcoal iron tubes would be more serviceable, and that the increase in weight of these would be more than compensated for by increase in life and reliability. Too much care cannot be taken to anchor fire brick. Through bolts are best.

The coal bunkers abreast engine rooms give no real protection because when trimmed for an attack they should be empty, to give the boat her speed. On account of the inaccessibility of the coal in them they would never be used except in long slow runs—so long and so slow that it would be much better to tow the boats than steam them. If the weight of a good screw transporter could be tolerated, these bunkers could be made more available. Practically one or two will always be used for the storing of quick-repairing stores and tools absolutely necessary for the boat to carry herself, and therefore it would seem better policy to use some of the bunker space for shallow store rooms for tools, gasketing, fire brick, etc., accessible from the engine room. There can be no properly constructed coal bunkers aboard torpedo boats, and the real solution of the difficulty is to resort to liquid fuel. Coal bunker plates in crowned deck boats should be larger than those in the Porter class, and fitted flush with the deck, with key screw, not butterfly or hex nut fastenings.

"Hatches over the engines as in the Foote class are most necessary, for light, ventilation, accessibility to the cylinders, and for saving life when a steam pipe is cut. If these hatches be in line with others they may have coamings and covers as in the Foote class; otherwise they should have sunken coamings flush with the deck, steel foothold gratings and tarpaulin covering for bad weather and for light hiding. The 'some protection to the engines and boilers' required of bunker coal by the department's circular of May 16, 1898, may be practically gotten for the engines of the destroyers. As to torpedo boats, am strongly of the opinion that the idea of engine protection by bunker coal is delusive; for not only should the engine room bunkers be empty to put the boat in fighting trim, but even if some coal be in them it will provide no protection, for the things most needing protection, the steam pipes that must be placed high. Therefore, for torpedo boats I would run the engine rooms out to the side, and, if necessary for coal supply, fit thwartship bunkers."

HULL CONSTRUCTION AND EQUIPMENT.

With reference to hull construction and repairs it is said that crowned decks give room and make coaling quicker and less wasteful than is possible with whale-backs decks. The memoranda for the bureau of construction and repair is quite extensive. It is as follows:

"The arrangement of hatches should be such that a fore and aft gangway on one or both sides be given. This is absolutely necessary for the efficient service of the torpedo tubes and guns, for men must move quickly in total darkness to serve the armament properly and this they cannot do in any of the boats in the flotilla, since no amount of familiarity with the location of hatches, blowers, etc., will insure not striking them in quick movements about decks. By using care in design, it would seem possible to place some of the fire and engine room hatches amidships in line with the stacks; others and the blower cowls in line with the engine room hatches, if these be fitted with coamings, and so leave narrow gangways fore and aft. Hatches over engines are desirable. In spite of the disadvantages of splinters in action, there seems to be nothing superior to gratings. Linoleum strips off, sand paint wears off and cannot be renewed without laying up the boat for a fortnight. Rubber tiling cuts up easily and the grease and salt water kills its life.

"Conning towers should have water-tight bottoms with doors through the vertical sides of the towers for access to quarters and for ventilation; each doorway to be fitted with a gasketed, water-tight threshhold, 6 or 8 inches high. The conning tower should have one good scupper pipe for letting the water out. It is impracticable to keep the conning tower water-tight in a seaway; the hood must be lifted for steering purposes and for ventilation. If the water coming in is kept from going below by the washboard threshholds there would be no difficulty as regards taking water forward. Curved pipe ventilators are impracticable, because they fill up with water as the boat dives into it, and can only be cleared by opening them from below and letting the water down. Those in Foote class drip a bit even when newly gasketed.

"Officers' quarters should be forward with access through conning tower. They should be lighted by large side air ports and fixed dead lights in the deck. Skylights are a nuisance, and do not ventilate as well as do air ports and conning tower. For men the quarters should be aft. The men's quarters in the Foote are good. Galley hatches should be as large as possible, and all possible arrangements made for taking away the heat.

"The steering engine, if steam, should be placed in the engine room, and the long lead of steam piping with the consequent heating and condensation avoided. The cutting of leads to the steam steerer valves when cut in action can be repaired easily; a shot cutting the steam pipe and wheel ropes is more serious. In my opinion an air steerer aft with low led piping from an air compressor in the engine room to an accumulator aft or in any convenient place would be better than steam. The compressor for the torpedoes, fitted to work on low compression and storing in an accumulator sufficient in volume to put the wheel hard over 20 or 30 turns at full speed, could be readily arranged and would be a great improvement on steam. The wheels in both conning towers should then be both power wheels and hand wheel placed on deck like the Ericsson's, for steering a course in heavy weather and for handling the boat to avoid the sea. The hand is far better than power for this purpose, as the feel of the helm, which one does not have with power gear, aids the helmsman.

"Box hatch covers with spring latches, such as are in use in the Du Pont, are far superior to those in the Foote and Ericsson, in that they are lighter, stiffer, and more nearly air-tight. The gasket in the Foote class hatches are never taken properly by the hatch covers. Awnings fitted with spreaders are more practicable in use both for cover from sun and rain and for water catching to fill tanks and boilers, than when fitted with midships stanchions. The castings for the spreader ends, as fitted in the Foote, are superior to the sheet metal reinforce of the Du Pont's. Masts should be light and fitted to readily douse. The hinged step of the Du Pont's mast is a good arrangement, but a 2-inch zinced steel tube mast, tall enough to show a four flag boat code hoist and fitted with a tube yard for four sets of halyards answers every purpose. The mast should be near the forward conning tower, forward of forward stack.

"The question of water tank material is a serious one. Copper should be used where it can be insulated from the zinced hull material. The shallow steel tanks of the Foote class rust inside and render the water almost useless for drinking, cooking and washing. When copper cannot be used, some efficient non-corrosive lining for the steel tanks should be sought. Cement cracks off and is practically useless. The tanks should be made as accessible as possible for interior cleaning. Wash room floors for both officers and men should be fitted with water tiles and with coaming 6 inches high and preferably tiled either with rubber or earthen tiles, so that sponge baths can be taken conveniently. If possible, these floors should be above the water line, so as to have natural drainage; if not, then the drain should connect with the water closet pump so that the drainage can be pumped out. Bath tubs, where there is room for them, as in the Du Pont class, are not very practicable. Standard basins should be earthen. The aluminum ones of the Foote class are hard to keep clean and are therefore unsatisfactory. Wash rooms should have cocks for each basin from fresh water tanks and from salt water pump delivery. A hand salt water pump in wash room is preferable to connection with power pumping system. Hand pumps should be strong, solid and capable of good volume. All hand pumps in the Foote class are inefficient. All drain pumps should be as large as space will allow, and with leads such as will allow easy cleaning. Auxiliary bilge suctions to each compartment connecting with auxiliary bilge pumps save much loss of fresh water in using syphons. Ashes and coal should be prevented from washing into the well by immovable fine mesh wire gratings.

"Towing arrangements should be carefully considered for United States boats, because no matter what the type, whether intended as true base boats or not, they must be capable of being moved long distances from base to base. Torpedo boats must be towed from the extreme stem, and there must be no chance for chafe. It is suggested that to the stem be fitted a strong three-fair lead forging, the two outer ones open and close for use with the anchor lines, the middle one solid for holding a towing bridle or head line when fast to a deck. The forging should be well back-strapped and down held, and the middle fair lead large enough to take the two parts of a chain towing bridle equal in strength to a 5-inch manilla line. If stock anchors and a fish davit be used, a single large fair lead will answer for both anchor lines and towing bridle. All cleats should be of the Herreshoff pattern, rather than like those on the Foote class, which cut the lines, are too heavy for their size and are not big enough for the purpose. There should be eight mooring cleats, four on a side, and those on the bow and quarter should be well back-strapped under the deck, to give strength for towing, and a midships fair lead aft should be fitted for towing bridle. Wooden gangway ladders should be fitted with eyes to hang from lugs inside the line of the chafing batten and with no

eye bolts for securing to the bottom. Standing sea ladders as in the Foote class are a menace to any other boat coming alongside and are not necessary. In general, since boats must often go alongside each other and alongside ships and wharves, there should be absolutely no projection of any kind beyond the chafing batten line. The practicability of fitting a rail 2 or 3 inches high inside the chafing batten for the purpose of utilizing the deck for catching fresh water is worth considering. If such a rail could be scuppered so as to carry off dirt and at the same time arranged to have scuppers readily closed and the water lead below, great saving in coal would be accomplished in wet weather."

ANCHORS, TOWING APPARATUS, LIGHTS, ETC.

In the matter of such equipment as anchors, tow lines, lights, etc., the following suggestions are made: "Stockless anchors, fitted to heave home on a bill board, would be a great convenience for boats operating on our coasts, where frequent anchorages must be made. As the riding lines must lead from the extreme stem when anchors are down, open and close fair leads on the stem would be necessary. No boat above 120 tons displacement should have riding lines less than 5/8-inch of plow steel, because in cross tides the boats surge on their lines and never ride head on. If stock anchors be used, the arrangement of those in the Du Pont may be accepted as satisfactory. Each torpedo boat of 150 tons and over should carry a 200-fathom 5-inch manila tow line and the destroyers in proportion.

Every boat and destroyer should carry a towing and in-tow bridle to insure against chafing lines and to distribute towing strains on the hull. The bow and quarter cleats should be the making-fast points for the bridle. This might consist of a small chain, two parts of which are fairly above the breaking strain of a new 5-inch line, long enough for the bight to be a fathom or two outside the fair lead on stem and stern in keel line when the chain ends are belayed to the cleats. A 4-inch grommet with two thimbles seized in, one for reaving on tie-bridle bight and the other for reaving the end of the tow line through, would prevent the chafe of the chain bridle on the bend of the line. Such a bridle could be rove off with a small reaving line at any time, the bending grommet taken well aft on the forecastle where the men could safely handle the tow line and the two points of the bridle adjusted at will, while slipping could always be done. The present towing arrangements are inadequate and dangerous. The Rodgers lost her best man from this cause. Every boat and destroyer that carries a dynamo should be fitted with a small search light for navigational and signalling purposes, and, in my opinion, also for military use in cutting off the beams from ships under certain conditions of attack. The French running lights supplied to the Porter are far and away superior to any others in the flotilla."

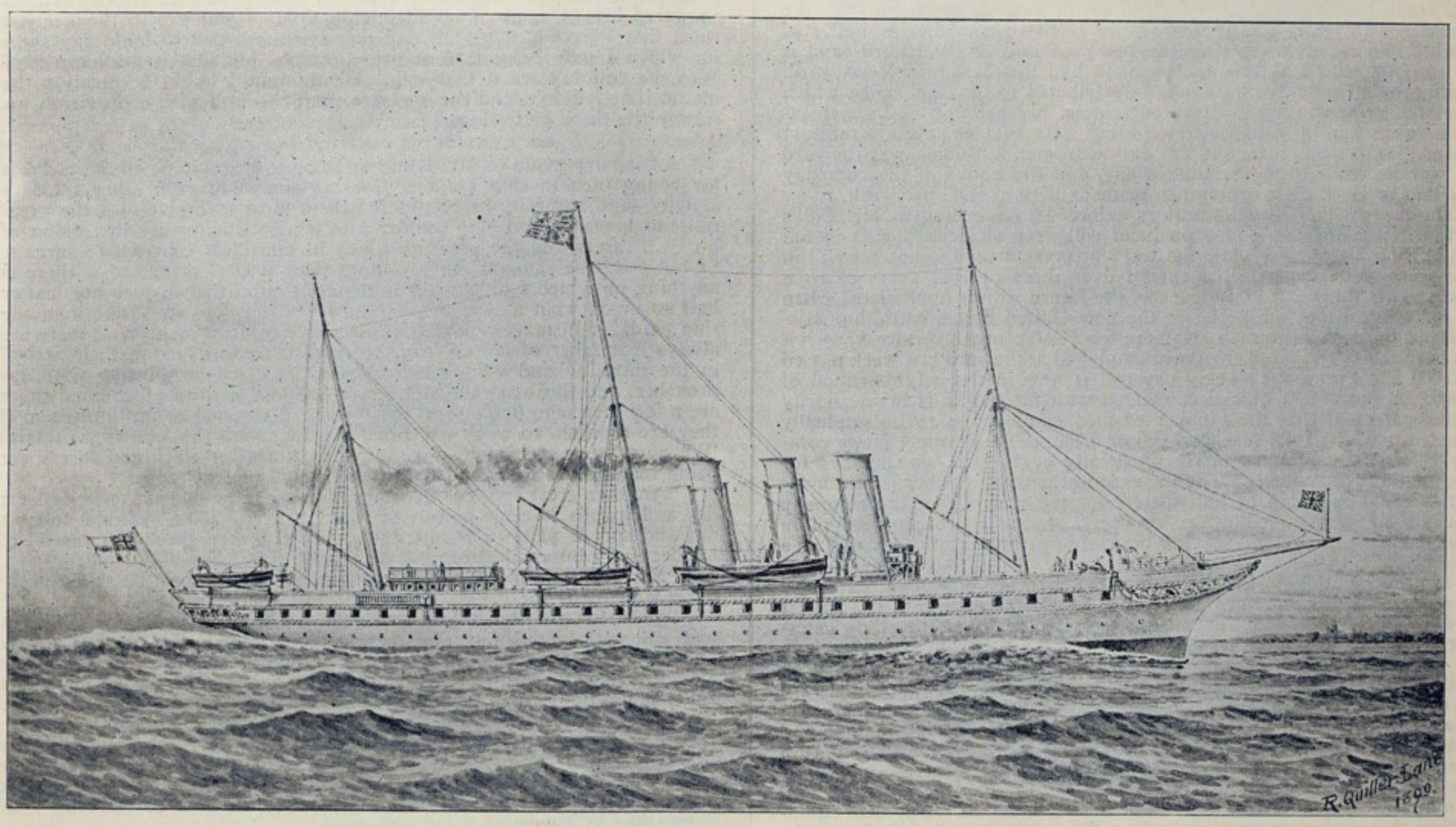
KIND OF GUNS DESIRED FOR SHORT-RANGE WORK.

On the score of ordnance the suggestions are as follows: "It would be well to keep all torpedo tubes, guns and mounts inside the rail line of crowned deck boats and destroyers. It is hoped that no turtle back craft will be built. The question of supplying one large calibre, low-power light gun to torpedo boats should also be considered. These boats must fall in with hostile destroyers in attack, and the advantage of having one large bore gun for stopping a destroyer is apparent. Under such circumstances the value of a large projectile would be very great, while the power of the gun might be very low, since 700 or 800 yards would be the extreme range for the night work, which need only be considered. I have no means of knowing whether or not this suggestion is absurd, but it seems to me that a gun designed on the general lines of the present field gun, but of lower power, might be made light enough to be tolerated. In all wars, as in the war just at an end, our boats will be expected to meet destroyers, no matter how much they may be outclassed by these latter, and the chance of effectively doing so would be enormously increased if they could deliver a stopping shot. It is to be noted that the ammunition weights for the large gun may be very small, since very few rounds would be wanted. In my opinion, two automatic 1-pounders and one of the indicated large guns would make a far more useful gun armament for a torpedo boat than four automatic 1-pounders. And for destroyers I would prefer low power 14-pounders and automatic 1-pounders to high power 6-pounders, for the combination of vibration and quick rolling render long range work very ineffective. Air compressors should be located in engine rooms, not in a separate compartment as in the Porter class."

THE ROYAL YACHT.

FIRST PICTORIAL REPRESENTATION OF THE MAGNIFICENT VESSEL NOW BUILDING AT PEMBROKE FOR QUEEN VICTORIA, TO COST $1,500,000.

By reason of special opportunites afforded Mr. R. Quiller-Lane, the English artist whom the Marine Review recently commissioned to prepare a picture of the royal yacht now building at the dock yard at Pembroke, we are enabled to present herewith the first picture as yet published of this very interesting vessel. No name for the yacht has been selected, but it is understood that the vessel will be christened either Enchantress or Balmoral. The yacht is now so near completion that May 9 has been set as the date of the launch, and the christening ceremony will be performed, if present arrangements be carried out, by the Duchess of York. The first keel plate was laid Dec. 23, 1897, by Mrs. Watson, the wife of Capt. Burgess Watson, superintendent of the dock yard, and it is expected that the yacht will be ready to go into commission by the close of the present year.



Steam Yacht Building at Pembroke Dock Yard for Her Majesty the Queen of England.

FROM DRAWING MADE FOR THE REVIEW BY R. QUILLER-LANE OF LONDON.

According to some representations, the British admiralty has sought to maintain a considerable degree of secrecy regarding the plans for the boat, but there is excellent reason for doubting the authenticity of these reports. The new yacht is 420 feet over all by 50 feet beam and will have a draught of 18 feet on a displacement of 4,600 tons. It will thus be seen that she is of 1,000 tons less burden than the Russian imperial yacht Standart, which was described in the Review some time ago, and 423 tons in excess of the German emperor's yacht Hohenzollern, which is not, however, strictly speaking, entitled to classification with the other royal yachts, inasmuch as she is nothing less than an armored cruiser with apartments fitted up for the emperor. The yacht now building at Pembroke will be fitted with twin screws and will be the first of the British royal yachts to be thus propelled. Boilers will be of the Belleville water tube type in three groups. The hull is to be of steel, sheathed with wood and covered with copper. As will be seen from the picture,the yacht will have three funnels and three masts.

Compared with the largest private yachts in the world this new vessel will, of course, stand out in striking contrast. The William K. Vanderbilt yacht Valiant, which is at the head of the list of private yachts, is only 332 feet over all, 39 feet beam, 16 feet draught and of 1,823 gross tons. The Payne yacht now building at the Bath Iron works, Bath, Me., and the J. Pierpont Morgan yacht Corsair, under construction at the yard of T. S. Marvel & Co., Newburgh, N. Y., are 303 feet and 302 feet over all, respectively. It may also be noted that the English yacht is expected to cost in the neighborhood of $1,500,000, which is about twice the amount expended on any of the large private yachts.

NEWPORT NEWS YARD.

A TREMENDOUS RUSH OF WORK AT THE GREAT AMERICAN SHIP BUILDING PLANT—PRESIDENT C. B. ORCUTT DISCUSSES THE PROJECT FOR AN ALLIANCE WITH VICKERS SONS & MAXIM OF ENGLAND--AN INTERVIEW WITH MR. COLLIS P. HUNTINGTON—MAKING A STRONG BID FOR REPAIR WORK GENERALLY.

Newport News, Feb. 28. In no ship yard in the United States does the amount of new construction and repair work now in hand approach in magnitude the aggregate of that in progress at the yard of the Newport News Ship Building & Dry Dock Co. in this city. To handle a constantly increasing volume of repair work of the heavier class and simultaneously carry along operations on over 100,000 tons of new construction is a problem involving for its solution no small degree of executive ability as well as energy, and the methods being followed here will no doubt afford much of suggestion for ship builders generally.

So heavy is the volume of business at this yard that night work has been the rule in many departments, practically since the opening of the Spanish-American war. Incidentally it may be mentioned that while much credit has deservedly been given to the various navy yards for the manner in which they met the exigencies of that period in the matter of repairing and refitting vessels, little has been said of the record—and it was not one whit less creditable—made by the Newport News yard. Possibly the failure to enthuse may be attributed to the same spirit which denied the army "regular" deserved laurels, because any of his achievments "were naturally expected of him." Be that as it may, the fact remains that in many instances not only workmen but officials at the yard here worked from 16 to 18 hours a day, and the books of the company show that some of the workingmen made as high as $200 per week.

The present activity is almost as enforced. According to Mr. Collis P. Huntington the work now on hand will keep all departments in full operation for two years, while the work at present under contract will in the case of some departments extend over three or four years or even longer. This statement as to work of the future will be appreciated when it is understood that the keels for the new United States battleship Missouri and the two large mail steamers for Pacific ocean service have not even been laid. The number of men employed at the yard last week passed the 5,000 mark, and the weekly pay roll is now in the neighborhood of $50,000. A prominent official connected with the works is my authority for the statement that the number of men employed is to be gradually increased until the total reaches 7,000 or 8,000. The Newport News company is now engaging regularly practically every man who applies for work and is at all suitable. The increase in the total number is not, however, as rapid as might be anticipated, for the reason that the company pursues a constant "weeding out" process, gradually dropping the more incompetent workmen and seeking perfection of organization as well as a large force.

Improvements now in progress at the yard are of a most extensive character. The principal projects, such as the construction of the largest dry dock in the world, the installation of two additional travelling cantilever cranes manufactured by the Brown Hoisting & Conveying Machine Co., and the construction of a new 550-foot pier, have, of course, been detailed from time to time, but nothing short of a personal visit to the yard will convey any idea of the great number of minor improvements being made simultaneously. Buildings are being enlarged and rearranged, and in several cases departments which have heretofore been restricted to a portion of a building will have the use of the entire structure. Officials state that on a conservative estimate the improvements now under way will entail an expenditure of $2,000,000, and inasmuch as the present equipment of the yard represents an outlay close on to $8,000,000, it will be seen that the investment at the close of the present year will aggregate very close onto $10,000,000.

PROPOSED ALLIANCE WITH VICKERS SONS & MAXIM.

Mention of the matter of this expenditure naturally brings up the subject of the still greater expenditure that will be made in the event of the consummation of the project for the establishment of an ordnance plant in connection with the ship yard, should an arrangement looking to that end be effected with Vickers Sons & Maxim, the English firm. In the course of a conversation on this subject, President C. B. Orcutt said:

"There have been no really very definite developments in the matter within the past few weeks, although the whole subject seems to be working out very satisfactorily. We are in constant correspondence on the subject, but like all extensive projects, time is required for its development and this is probably all the more true by reason of the distance which separates the principals of the two concerns. All the English gentlemen interested have now, however, visited our plant here at Newport News and they have shown no hesitancy in expressing their satisfaction at the showing made. Some of them stated to me that there might be more extensive British ship yards but that they knew of none more perfectly equipped.

"The visitors were especially impressed by our plan of moving work forward from the time material enters the yard until the hull is completed, and the use of exactly the same methods in the machinery department, thus obviating the necessity for a single unnecessary movement of material, and reducing the loss of energy and handling charges to a minimum. The details of the consolidation have not, as I said, been perfected. If it goes through, as is probable according to present indications, it will mean an additional investment of several million dollars at Newport News. There is no particular hitch in the negotiations. Our English friends naturally wish to secure the most advantageous terms possible, while Mr. Huntington, being assured that he has a good thing, insists on making his own terms. We have not as yet settled upon a plan for the consolidation. It may be decided to merge all interests into one general institution, but it is much more likely that there will be two separate organizations, both controlled, however, by the same general management. Meanwhile we are making no particular effort to hurry matters, having as you see about all we can attend to here. Why we have refused orders for six steamers, simply because we could not guarantee delivery at the time specified."

It is interesting to note the enthusiasm which is maintained unimpaired by Mr. Collis Huntington, the moving spirit and principal stockholder in the ship yard enterprise, in the wisdom of his selection of Newport News as the site for a ship yard. During a conversation in his private car the other evening, I asked Mr. Huntington how he happened to select Newport News as a site for the ship yard and he said: "Well, I was down here in 1837 and I said then that I thought New York ought to have been established here. When I was in Europe, a few years ago, they asked me if I had much of a ship yard over here and I said 'Well, I don't know; I think I have a pretty good yard, but of one thing I am certain, I have the place.'"

Then Mr. Huntington went on to tell a story that well illustrates the forceful character of the man. He had been referring to his reasons for the belief that American goods ought to be carried in American bottoms, and that a large navy is a good thing, even as an investment.

"Strange as it may seem," he said, "no advocacy of these things on my part has been actuated by my interests as a ship builder. Why, do you know, once when a naval program was under consideration a senator who is a friend of mine came to me and said: 'Mr. Huntington, this bill provides for only three battleships. We can just as well make it six if you will direct the attention of a few of your friends to the matter.' I answered him 'Oh, no; I could not do that. I will say to them if you wish, that I have a ship yard and that I will be glad to build any ships for which I may be able to secure contracts, but that is all I can say.' Well, he couldn't see it that way. He thought I ought to mention the matter, but I didn't, and the measure went through with a provision for simply the three battleships."

MR. HUNTINGTON'S ADVICE TO YOUNG MEN.

An inquiry made of Mr. Huntington as to his opinion of the chances for young men in ship building lines as compared with other fields of activity—and naturally he considered them most favorable—led the great railroad manager and ship builder into a most interesting discussion of his own career and the precepts which he considers essential to success. "I tell you," he said, "I employ more than 100,000 men, and if there is anything on which I am firm it is the conviction that it does not matter half so much what a man does as how well he does it. Take it in the ship yard, for instance. Sometimes we have to drop men. Well there are always a number of fellows who are invariably tardy upon their arrival in the morning and who watch closely the clock as quitting time approaches, and those are the fellows we let go. On the other hand there are a few men who don't seem to consider it unusual or an imposition if they are required to work overtime, and these are the fellows we retain. 'We must keep such men,' we say, when times are slack and forces are being reduced, 'as we would not know how to replace them.'

"Another great secret is in saving money. If a man makes a dollar a day and spends 90 cents he can be happy, whereas if he makes a dollar a day and spends $1.10 he is in trouble. Then a man should be careful of his health. Abuses in eating kill more men than abuses in drink."

"Mr. Huntington, how about the precepts that might be called peculiarly your own—the ones you have put into daily practice?"

"Well, for one thing, I never think of tomorrow or of yesterday. A man will wear himself out if he does. When I worked for others I always made it a rule to talk as little as possible during business hours. I have aimed to have uniformly sober and regular habits, and I have made it a rule that nothing shall be too big for me to attempt and nothing too small to require my attention. When I was a country merchant I came to realize that you must win and keep the confidence of the public in the promises which you make, and must also make it a study to be agreeable to your most obnoxious customer. Above all, don't tell people about your plans, unless you are seeking the surest method of allowing your competitor to anticipate your next move."

It required some little persuasion to induce Mr. Huntington to tell of his first business venture. Finally consenting he said: "Well, I had a lot of old property—it was really worth very little—and I succeeded in trading it for a thousand clocks. I sent them out in small consignments to towns along the Erie canal and then followed them up in about a week and sold every one at $5.00, clearing $5,000."

When we got back to a discussion of ship yard matters, Mr. Huntington talked of the immense new dry dock, which it is easy to see is a project very near to his heart. Excavation is under way, the Lidgerwood Manufacturing Co. having installed a trolley system that is facilitating the work materially. It is anticipated that a year will see the completion of the project. One point which I raised in inquiries of Mr. Huntington and the other officials was the motives that prompted the selection of wood as a material for the dock in the face of the vigorous contention for stone docks now being made by the civil engineers of the navy department. The replies elicited demonstrated that the Newport News officials have gone into the subject quite as fully as any of the advocates of masonry structures. Moreover, their deliberations have had the benefit of experience afforded by the service of the present dock. Statements made by the Newport News officials are to the effect that climatic conditions being taken into consideration, the decision is preeminently in favor of timber. According to their estimates the cost of a stone dock of the dimensions planned would be approximately three times the cost of a timber dock, and the interest on the heavy first cost of a stone dock would be largely in excess of the estimated cost of repairs to the cheaper dock for a great number of years to come. Of course the entrance, which will be inaccessible to repairs, will be of stone.

Repair work is a big item in this ship yard. If this new dry dock had been completed two years ago it would have been kept busy every hour of the time, together with the other dock. Just now there are on hand at the yard thirty-three repair jobs, and some of them are of great magnitude, as for instance the thorough overhauling of the American liner Paris, which is to leave New York next month for a West Indian

cruise. I received, of course, a confirmation of the statements made as to the award to the Newport News yard of the contracts for the Pacific Mail Line steamers, which will be the largest yet constructed in America. Only the preliminary plans have thus far been prepared, and the keels will not be laid until after the launch of the first two Morgan liners, which are expected to slide into the water about the middle of March. A few days beyond that date will probably see the builders' trial of the battleship Kentucky.

Prosperity at the Newport News ship yard is clearly reflected in general business conditions in this rapidly growing city. Real estate is in many cases bringing prices of such proportions as to almost lend a suspicion of inflation.

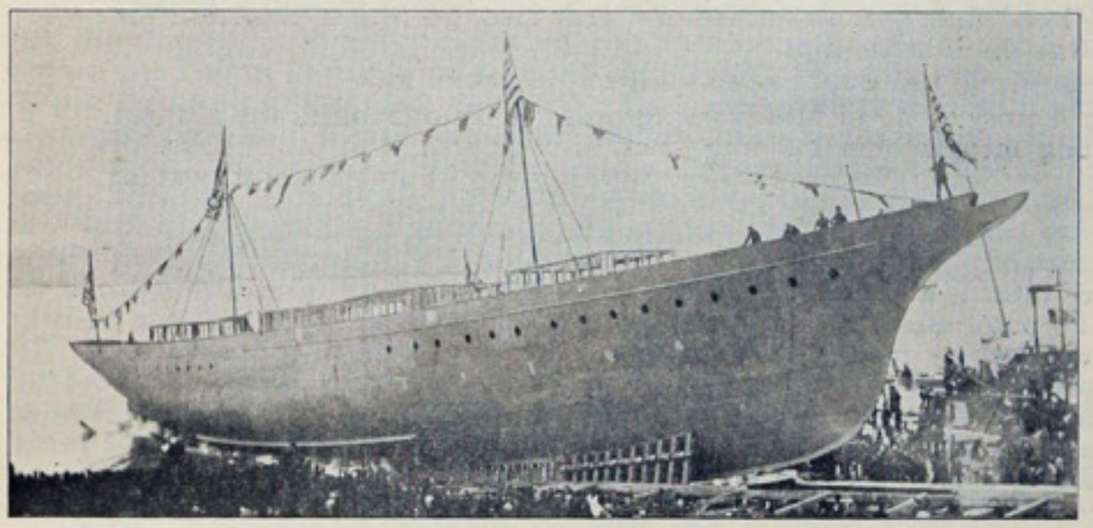
WALDON FAWCETT.

COMPOUND "SIMPLEX" FEED PUMP.

ECONOMICAL FORM OF FEED ADAPTED ESPECIALLY FOR MARINE USE—TO BE APPLIED IN THE MORGAN YACHT CORSAIR.

The subject of improving the economy of the auxiliaries of steam vessels is being discussed with considerable interest, both here and abroad, and in many cases foreign engineers are leading this country in this respect. We not only refer to such auxiliaries as dynamo engines and engines for running the centrifugal circulating pumps, but also the steam pump equipment of vessels. It is a common thing to find that the auxiliaries of a sea going vessel will average in steam consumption 15 per cent. of all the steam generated by the boilers.

Prof. J. E. Denton and Col. E. A. Stevens in their paper read before the American Society of Mechanical Engineers, about ten years ago, showed that the Hoboken Ferry Co.'s double-end screw ferry boat Bergen required on her trial trip about 20 per cent. of all the steam generated by the boilers to run the auxiliaries. As the pumps used most



MORGAN YACHT CORSAIR ON THE STOCKS.

of this steam, it is very evident that anything in the line of improving their economy is of utmost importance. Mr. F. Meriam Wheeler, in his paper, "Economy Test of a Unique Form of Feed Pump," read at the last meeting of the Society of Naval Architects & Marine Engineers in New York (a notice of which we gave in our issue of Nov. 17, 1898) has called the attention of marine engineers and naval architects to a very economical form of feed adapted especially for marine use. Mr. J. Beaver Webb, the well-known naval architect of New York city, has contracted with the Geo. F. Blake Mfg. Co. for a compound "Simplex" feed pump for Mr. J. Pierpont Morgan's new steam yacht Corsair, the construction of which will be similar to that referred to in Mr. Wheeler's paper. We give an illustration of the Corsair's feed pump, and it will be noticed that the arrangement consists of two vertical double-acting pumps of the single-cylinder type, the water cylinder of one being an exact duplicate of the other. The steam cylinder of one pump, however, is made larger than the other, so as to use its steam expansively, namely, by exhaust from the first, or high pressure cylinder to the second, or low pressure cylinder.

In other words, this design consists of a Blake "Simplex" vertical double-acting steam pump for the high pressure side having

11" diameter steam cylinder
7¾" diameter water cylinder
18" stroke,

And for the low pressure side a pump having

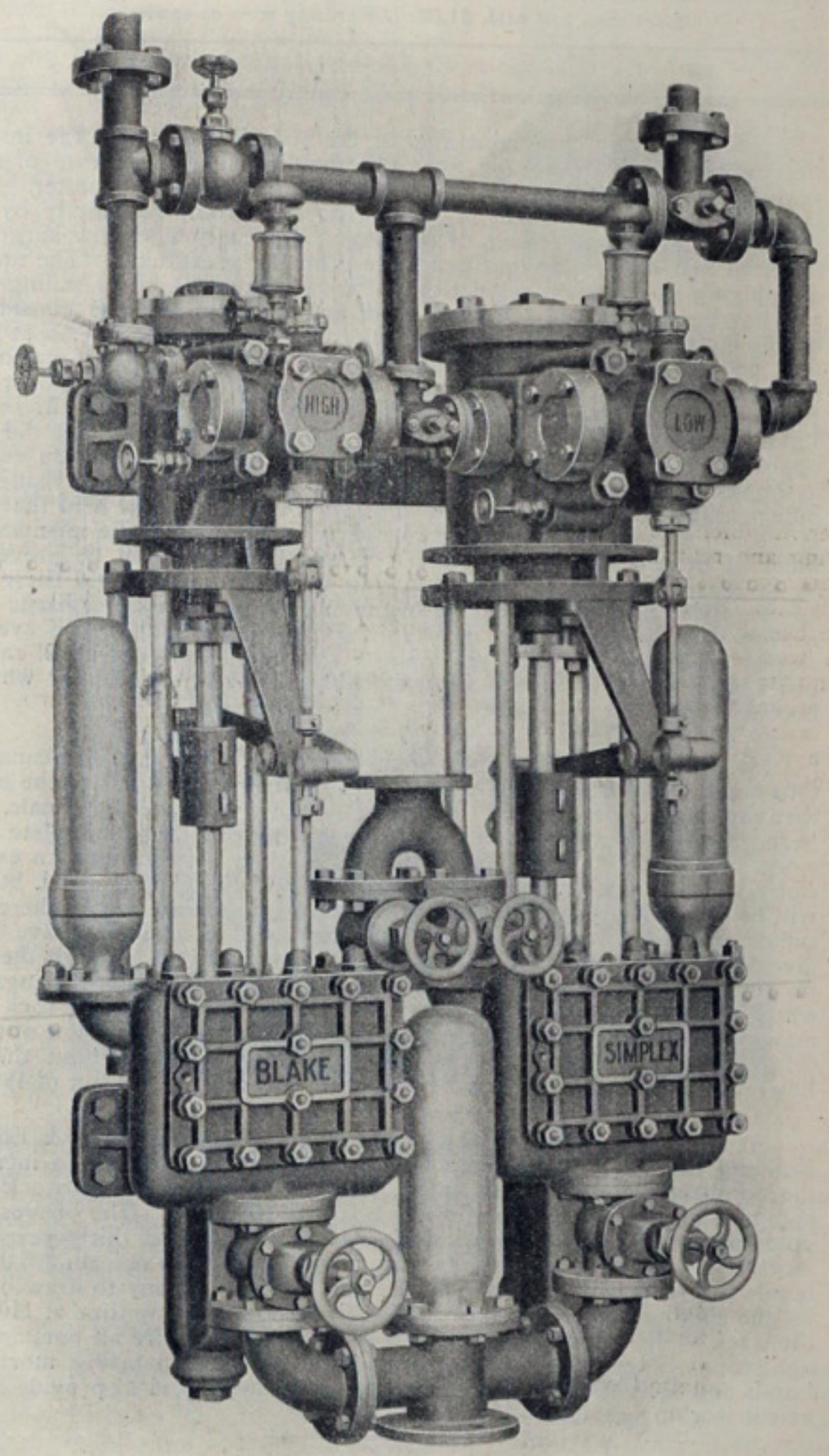
16" diameter steam cylinder
7¾" diameter water cylinder
18" stroke.

Both water cylinders are connected to one and the same suction nozzle, provided with a suitable suction chamber. The discharge of each pump leads into a Y connection as shown, the usual air chamber being placed on the side of each water cylinder.

A pump of this same system built for a Thornycroft torpedo boat was recently tested in England for the benefit of the British admiralty, and although the steam pipe was not protected by covering of any kind, the economy was quite remarkable, namely, 52 pounds weight of steam per I.H.P. per hour when running non-condensing. The pumps for the Corsair, being of larger size, are expected to show a record as good as 45 pounds per I.H.P. per hour. Inasmuch as the average economy of a duplex pump is anywhere from 100 to 150 pounds weight of steam per I.H.P. per hour, it will readily be seen what a great advantage this type of compound pump possesses.

Past Assistant Engineer W. W. White, U. S. N., in his prize essay read before the American Society of Naval Engineers about a year ago, showed that the best economy for the duplex pumps on the U. S. S. Minneapolis was 90 pounds weight of steam per I.H.P. per hour, while the average was 120 pounds, and in some cases the consumption was as high as 200 pounds per I.H.P. per hour.

In considering the practical advantage of this unique form of compound feed pump the Blake company urges that it not only represents minimum weight and space, but has the advantage of containing within itself, so to speak, an auxiliary or spare pump, as either side of the pump can be operated independently, as before mentioned, should occasion require. As regards the amount of steam that can be saved by this system, there is no doubt but what the pump will save its own weight in coal in twenty-four hours' steaming. As an illustration, take a pair of these pumps, say weighing, with the attachments, half a ton. Pumps of this calibre would easily handle at the rate of 17,570 pounds of feed water per



hour. Now, this amount of water would supply the boilers necessary to operate a marine engine of the triple expansion type of about 1,100 horse power. The power of the pump would be about half of one per cent., or say 5½ I.H.P. On the basis of a saving of say 70 pounds weight of steam per I.H.P. per hour over and above what would be ordinarily used by a duplex pump of the simple type, this shows a total saving of steam (feed water) of about 385 pounds per hour, or say 50 pounds of coal per hour, on a basis of about 8 pounds of water per pound of coal, for the rate of boiler evaporation. This gives a total saving of 1,200 pounds of coal per twenty-four hours, which, it will be observed, is somewhat more than the weight of the pump. Or, as compared with the single system of feed pump, a cross-compound "Simplex" would save its weight in coal in forty hours.

One of the new steamers being built by the Cleveland Ship Building Co. for the Zenith Transit Co. is to be provided with an independent vertical air pump of the Blake cross-compound "Simplex" system. The main feed pumps for this vessel are also to be Blake compounds.

The navy department has decided to sell the old monitor Comanche, now lying at the navy yard at Mare Island, Cal., and has advertised for bids. The monitor has survived its period of usefulness, and the space it occupies at the navy yard is needed for modern and more formidable craft. The Comanche was built in Jersey City in 1863, and was considered one of the best fighting craft of her kind during the Civil War. She is a single-turret, single-screw monitor of the Passaic class. She displaces 1,875 tons, is 200 feet long, is 45.11 feet in beam and 11.6 in depth. Her engines are of 350 I. H. P.

Capt. Robt. C. Soper, harbor-master at Buffalo, is to be succeeded by Capt. John Burns, who commanded vessels of the Lehigh Valley Co's fleet during several seasons past.

MARINE REVIEW

Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

Published every Thursday at No. 418-19 Perry-Payne building, Cleveland, Ohio, by THE MARINE REVIEW PUBLISHING CO.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, $1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

If there is any complaint against the law providing for the inspection of sail vessels over 700 tons and the licensing of officers of such vessels, the vessel men have only themselves to blame in the matter. This law, which goes into effect in July next, was prompted largely by the increased size of sail vessels of late years, especially steel tow barges of the kind that have come into general use on the great lakes. The matter of applying government regulations of the steamboat kind to sailing vessels has been discussed for years past, and the new law was considered by the legislative committee of the Lake Carriers' Association on at least two occasions before its adoption. There was no rush in putting it through congress. It had been held under consideration for almost two years. All interests had ample time to be heard regarding it. The Lake Carriers' committee did not recommend its passage but did not oppose it, for the reason that they were not disposed to go on record as opposing regulations for the navigation of big tow barges that were indispensable in the management of steam vessels. It was held that loss of life and damage to other vessel property on account of the mismanagement of these large sailing vessels or tow barges should be prevented by safeguards similar to those applying to steam vessels, and there was apparently nothing to offset this argument. The captain in charge of a modern tow barge today has far more responsibility than the average steamboat captain of a few years ago. The new law is not at all radical in its requirements and will very probably be found satisfactory when it becomes operative.

Mr. Collingwood Schreiber, deputy minister of railways and canals at Ottawa, was asked, a few days ago, as to the truth of reports to the effect that the contractors for the deepening of the St. Lawrence Canals, had been granted an extension of time to the spring of 1900 to complete their work. He said that Contractor M. P. Davis had been granted an extension to the spring of 1900 for the completion of the Galops canal, but he will be obliged to provide tugs to tow vessels up stream where there is a sufficient depth of water. The Soulanges canal contractors have been given until May 15 next to complete their undertakings, though there is no certainty that they will be ready by that time. Larkin & Sangsters, who have the Farran's Point canal, have encountered 5 feet of rock that may interfere somewhat with the progress of their work. In view of these delays, it is quite probable that 14-feet navigation throughout the St. Lawrence canals will not be provided until well into the season of 1900.

At a special meeting of the William Cramp & Sons' Ship & Engine Building Co., in Philadelphia a few days ago, it was decided to increase the company's indebtedness by $1,500,000. This increase of stock was recommended last December by the board of directors. The proposition voted upon was the authorization of an issue of $1,500,000 thirty-year first-mortgage 5 per cent. gold bonds, with a sinking fund to redeem $25,000 of bonds per year, with the right on the part of the company to draw bonds for the sinking fund, or to retire the entire amount at any time at 110. By the issue of these mortgage bonds it is proposed to retire all outstanding obligations of every description, including $537,000 maturing mortgage bonds and $500,000 of secured floating indebtedness, and to provide a sufficient working capital.

It is quite probable that the present congress will provide appropriations for three new revenue cutters, two for the great lakes and one for the Pacific coast. Senator McMillan of Michigan has managed to secure in the sundry civil bill the incorporation of items providing for these vessels and will probably hold the appropriations upon final consideration of the bill. It is proposed to give the lakes, in return for the vessels recently taken to the Atlantic coast, two cutters on which the limit of cost is to be $330,000, of which $165,000 is to be provided at once. The Pacific coast vessel is to cost $225,000, one-half of which is to be immediately available.

The hydrographic office of the navy and the engineer officers of the army in charge of lake districts are providing shipmasters with some excellent new charts of late. They are being made up from supplemental surveys and from all manner of additional information that tends to improve the old charts. The hydrographic office has just issued a chart of Lake Erie on a single sheet that is a big improvement over all its predecessors. It sells at 80 cents.

A correspondent of the Review at Belfast, Ireland, cites it as an interesting evidence of the methods employed in the conduct of the business of Harland & Wolff that the great ship builders upon the occasion of the recent launch of the Oceanic went to an expense of $2,500 to have the vessel painted white, simply that the operators for the biograph might secure good pictures of the launch of the largest vessel afloat. Our correspondent further states that the huge gantry crane used in the construction of the Oceanic has proven such a huge success that Harland & Wolff have placed with Mather & Platt an order for a duplicate.

Officials of the Union Iron Works, San Francisco, continue to receive congratulatory letters and telegrams upon the performance of the Japanese cruiser Chitose, which was illustrated and described in the 1899 Ship Building edition of the Marine Review, and which on a recent trial averaged 22.87 knots, the maximum speed attained being 23.76 knots.

TO INCREASE WELLAND COMMERCE.

PLAN OF HAVING SHIPS OF 3,500 TONS CAPACITY LIGHTER PART OF THEIR CARGOES AT PORT COLBORNE.—FIGURES RELATING TO COST OF TRANSPORTATION.

BY DEW. CARTER, VESSEL OWNER OF PORT COLBORNE, ONT.

A great deal has been written lately on the question of cheap transportation from the northwest to the seaboard. Georgian bay, as a transshipment point to Toronto and other places, has been given most attention, and our all-water route on which so much money has been spent, and which is not yet completed, has been almost ignored, though it should be, and, if put in proper condition, will be, the main and cheapest outlet for all grain and coarse freights from the upper lakes to tide water. Some writers have proposed giving the Americans free coasting in our waters even though they did not reciprocate. That would be an injustice to Canadian vessels, and I cannot see where there would be any benefit derived from it. When our own boats are not able to do our coasting trade it will be time enough to give it to foreigners. Complete our Canadian canals through to Montreal and improve those built first, or nearly twenty years ago; improve also and complete the harbors at Port Colborne and Port Dalhousie, and American grain as well as our own northwest grain will find this cheap route to the Atlantic.

Port Colborne harbor, the entrance to our canals from the upper lakes, has never been completed as originally intended. There was to be 18 feet of water at all times, and last season the maximum draught at which a boat could enter in calm weather was 15½ feet. In rough weather boats are afraid to enter drawing even 14 feet, and they either lay to at Long Point, 50 miles west of here, or run past to Buffalo to wait for the sea to run down, and on their arrival here often find that the water has fallen, and that there is not enough water on the mitre sills of Port Colborne lock to allow them to pass over. They are consequently often delayed, or, if they have grain, compelled to lighter a portion of their cargo at a cost of perhaps more than they get for carrying that portion from the upper lakes to the St. Lawrence. The cost for elevating grain here, carrying it to Port Dalhousie and reloading it in the boats again there, was 2 cents per bushel last season, and as grain was carried from Lake Superior to Lake Michigan through the Welland canal to the St. Lawrence ports last season for 1¾ to 2½ cents per bushel, the lighterage rate of 2 cents was simply prohibitive, and the elevator here lay idle for nearly five months. The distance from Port Colborne elevator to Port Dalhousie elevator is about 25 miles, or one-third the distance from Collingwood to Toronto, where it is proposed to transfer the grain for 1 cent per bushel; with proper facilities why should it not be done here for much less? At present there is a great deal of time lost here when boats can afford to lighter or are compelled by low water to do so, as the elevator here is now a back number, being over 40 years old, with no improvements, and averaging usually only about 3,000 bushels per hour when unloading grain.

The normal depth of water on the mitre sill of Port Colborne lock is now about 13 feet 9 inches. During most of the past season the depth did not average 13½ feet, and during easterly winds it was frequently less than 13 feet, and occasionally less than 12 feet, although it was intended when built that there should at no time be less than 14 feet between Lake Erie and Thorold, the summit level of the Welland canal. During about five months of last season the Grand Trunk railway lighterage rates were prohibitive. The boats were compelled to load to only the Welland canal draught, and as there was often not 14 feet, they either came through with less than their full canal load, or, if they were loaded to 14 feet, ran the risk of detention at Port Colborne or of sticking fast on the level between here and Thorold, or detention at Thorold. Is it not astonishing that in the face of all these difficulties and with the low rate of freight boats carried any grain at all through the Welland canal last summer? With Port Colborne and Port Dalhousie harbors deepened and the former protected by a breakwater running south-easterly from Sugar Loaf reef, so that boats could enter in all weathers drawing 18 feet of water, the canal between Port Colborne harbor and Thorold deepened and improved so that it could be safely navigated by a boat drawing 14 feet at all times, and with a reasonable lighterage rate from here to Port Dalhousie, say of 1 cent per bushel, what route could profitably compete against a modern steel bulk freight steamer suitable for lake and seacoast service that can pass through our canals to Montreal and carry (including 100 tons of fuel) 3,500 tons of freight or 116,666 bushels of wheat on a draught of 18 feet? This same vessel could carry 3,000 tons, or 100,000 bushels of wheat on a draught of 16 feet, or 2,500 tons on a draught of 14 feet, the limit of our canals when completed. On a freight rate of 2 cents per bushel, from Lake Michigan or Lake Superior to Kingston, such a steamer would draw a freight of $2,333—less a lighterage charge from Port Colborne to Port Dalhousie of 1 cent per bushel on 33,333 bushels—leaving her $2,000 for a five days' trip one way, with the chances of an up freight of 2,500 tons of coal, that would pay well for the run back. There is no question about the capacities of this steamer at the draughts of water mentioned, as I have the blue prints and specifications before me, furnished by a reputable ship building firm, who will guarantee to build a powerful up-to-date steel steamer with all the latest modern improvements for less than $1 per bushel for her carrying capacity of wheat at 18 feet draught of water. There is a great amount of corn shipped from Toledo through New York state to the Atlantic, and the American harvest for it is much earlier than our northwest wheat harvest. There is no reason why a large proportion of this and other American corn and wheat that is moving during the whole season of navigation should not pass down our canals to ocean steamers, and if we secure a large portion of this American grain our own northwest wheat will certainly follow it up to November at least, instead of going to Buffalo and down through the free Erie canal. I wish, in another letter, to say something about canal tolls on coarse freights going eastward and westward through the Welland canal; also about necessary improvements to canals and harbors.

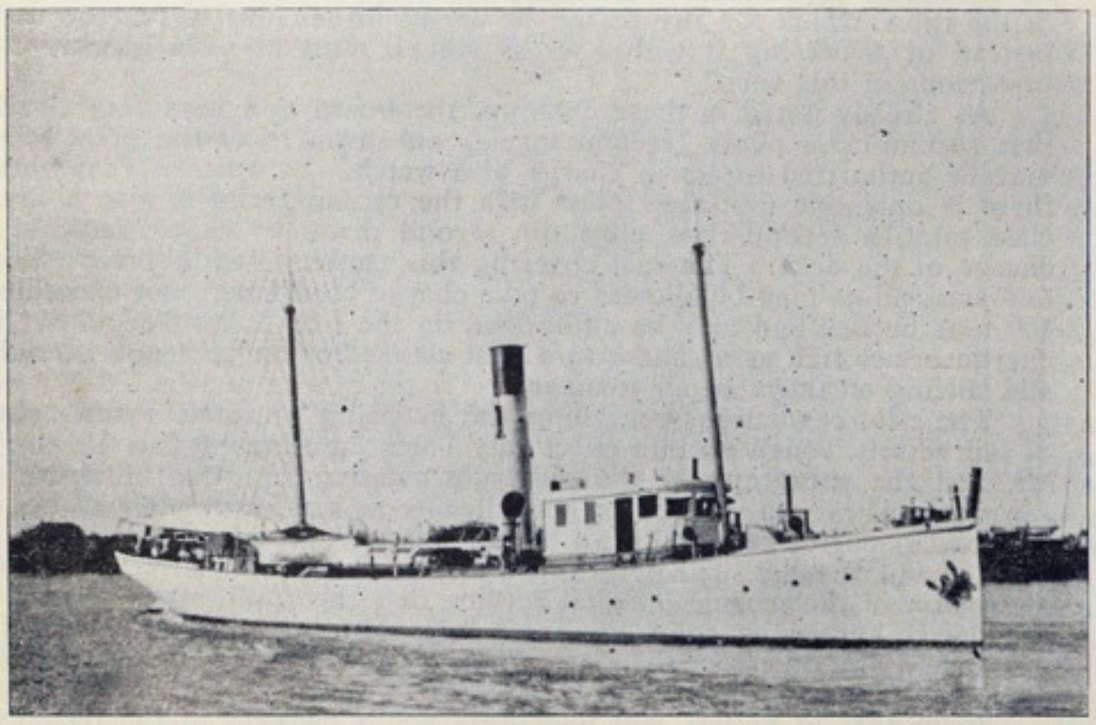
The C. Reiss Coal Co. of Sheboygan, Wis., is erecting five new coal lifts at its No. 1 dock. The capacity of the new lifts will be 120 cars per day.

STEAM PILOT BOATS.

MODERN STEEL VESSELS NOW IN USE ARE A VAST IMPROVEMENT OVER THE CRAFT OF A FEW YEARS AGO—SOME TYPICAL PILOT STEAMERS.

During his recent southern tour President McKinley made a trip down the Savannah river in the steamer John H. Estill as the guest of the Savannah pilots, and this has served to emphasize the attention which has been given of late to improvement in the methods followed and vessels used by the more progressive associations of pilots throughout America. The new steel pilot boat bids fair to ere long completely supplant the old-fashioned craft of other days, and of this new type the John H. Estill is a fitting example. She is 130 feet long and of 243 gross tons, and her fittings include Baldt stockless anchors, with steam auxiliary machinery that is generally of modern type.

The New York, owned by the Sandy Hook Pilots Association, is another of these modern boats, and she has demonstrated her efficiency



SAVANNAH PILOT BOAT JOHN H. ESTILL.

in actual service. She is 155 feet over all, 140 feet on the water line, 28 feet beam and 14 feet draught, loaded. She can, it is claimed, carry coal, water and stores for one month, with accommodations for fifty men. In order to promote quick steering and general handiness, the forefoot is considerably cut away and the screw is placed much further forward than usual. This vessel is especially buoyant and is enabled to back or go ahead in almost any sea by reason of the fact that the bow projects well over the water and the counter is carried down to the water line. The space between the engines and boilers is utilized for coal bunkers, with a capacity of 100 tons, while forward and aft are large water tanks. With this distribution her trim remains the same whether loaded or light. There are two steel deck houses, and below deck two large saloons and twelve staterooms. The New York is fitted with a compound engine with cylinders of 26 and 48 inches by 30 inches stroke, developing 800 horse power. Steam is supplied by two single-ended Scotch boilers, each 10½ feet in diameter by 11 feet in length, with two furnaces and a working pressure of 110 pounds. She cost $85,000.

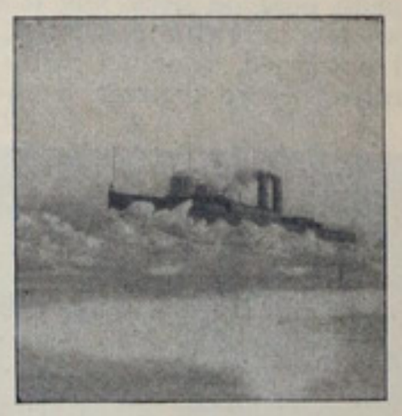
The Pennsylvania & Delaware Pilots' Association has a handsome new pilot boat, the Philadelphia, completed a few months ago by the Neafie & Levy Ship & Engine Building Co. of Philadelphia, to replace the pilot boat which was sold to the government at the opening of the Spanish-American war. The new Philadelphia is 147 feet over all, 26 feet beam and 16½ feet depth. She has compound engines with cylinders of 20 and 40 inches by 28-inch stroke, and a Scotch boiler 14 feet in diameter by 12 feet long, allowed a working pressure of 125 pounds. The equipment is thoroughly modern and includes powerful wrecking pumps, a 10,000 candle power search light, etc. The speed of the boat is 15¼ miles and she cost $75,000.

EFFECTIVE SHIPS OF THE DIFFERENT NAVIES.

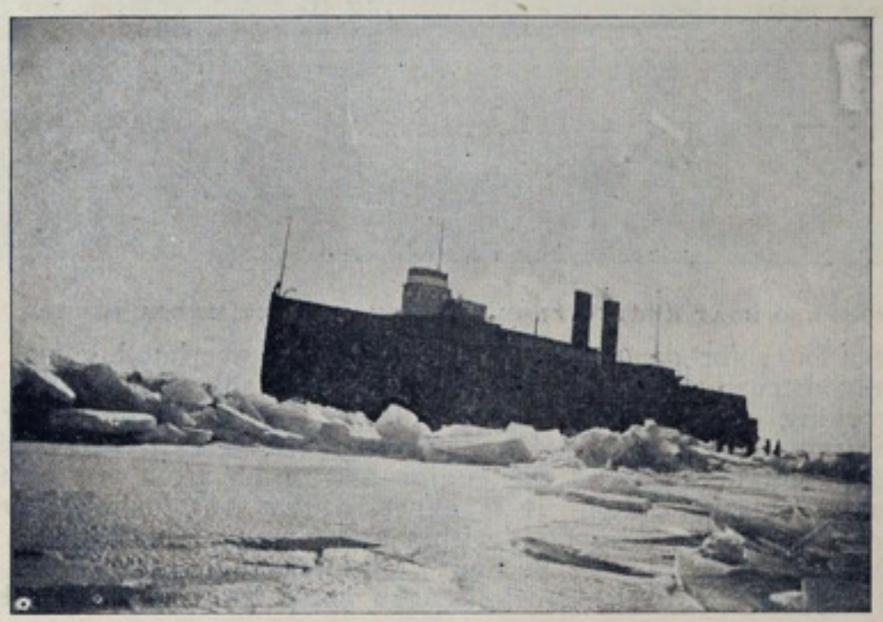
According to a French naval contemporary the number of ships really serviceable in their respective classes which France possessed at the end of 1898 were: 36 ironclads, 37 cruisers, 16 destroyers and 181 torpedo vessels, while England is credited with 42 ironclads, 112 cruisers, 120 destroyers and 77 torpedo vessels; Germany, 17 ironclads, 22 cruisers, 11 destroyers and 118 torpedo vessels; Austria, 8 ironclads, 7 cruisers, 7 destroyers and 56 torpedo vessels; Italy, 15 ironclads, 27 cruisers, 2 destroyers, 88 torpedo vessels; Russia, 26 ironclads, 23 cruisers, 73 torpedo vessels; United States, 10 ironclads, 30 cruisers, 1 destroyer, 17 torpedo vessels; and Japan, 6 ironclads, 15 cruisers, 23 torpedo vessels. The whole fleet of these powers is therefore 1,055 vessels of the classes named, 143 ironclad, 251 cruisers, 146 destroyers and 515 torpedo boats, all effective. The same authority asserts that the proportion of officers to men in the French navy is higher than in that of any other country, Austria alone excepted, the number of officers for every 1,000 men being in the French navy 57, in the English 55, German 52, Italian 45, and Russian 40. Next year, however, in consequence of the proposed increase of personnel, England will head the list with no fewer than 60 officers for every thousand men. The inequality at present existing in this respect between the English and French navies is ascribed to the great number of officers of junior rank necessitated for the command of the torpedo flotilla, France being so strong in this class, especially as it is necessary, for the training of crews and officers, that these little vessels should be kept constantly in commission. England is now beginning to realize the inferiority in the fighting value of her ships, which arises from leaving them unarmored forward, and hence the last addition to be made to the British navy is to carry her armor to the spur.

CAR FERRY AFLOAT IN AN ICE FIELD.

With the thermometer in the region of the great lakes ranging from 18 degrees below zero on Lake Erie to 30 or more below on Lake Superior during the recent period of extreme cold weather, it is not surprising that some of the winter lines of car ferries and ironed propellers have met with serious drawbacks. The small pictures presented herewith were made from kodak views of the car ferry steamer Shenango No. 1, which for more than a month past has been floating around Lake Erie in the vicinity of Long Point, with a great mass of ice piled mountains high around her. A part of the crew have remained with the vessel since she was caught in the ice off Port Burwell, Ont. (Canadian shore) on Jan. 25. At last accounts the vessel was still in good condition in the center of the big ice field, fifteen miles off a place called Clear Creek, Ont., and the men in charge went ashore each day for provisions and other supplies, but entertained no hope of release of their ship until heavy winds and moderate weather combined to break up the ice.



This vessel is one of the two car ferries, Shenango No. 1 and Shenango No. 2, built three or four years ago for the transportation of railway cars, laden mostly with coal, between Conneaut, O., and the Canadian shore across Lake Erie. The venture was not altogether successful, and one of the car ferries was transferred, some time ago, to Lake Michigan service. The Shenangos are not high-powered car carriers of the kind that are used in the Straits of Mackinac, and in crossing a long stretch of open water on Lake Erie they were not able to keep up a



regular service, even in the heavy weather of fall months. The traffic also fell short of what was expected. It is probable, however, that notwithstanding the present unsatisfactory position of this vessel in a great field of ice she will be released without special difficulty. The Review is indebted to W. A. McLeod and Robert Matson, who were aboard the Shenango, for the pictures.

COMMODORE MELVILLE ON FORCED DRAFT.

In a magazine article dealing with progress in marine engineering, Engineer-in-Chief Geo. W. Melville of the United States navy pays Mr. James Howden the compliment of having been the first engineer to take up the question of economy in connection with forced draft. Commodore Melville says:

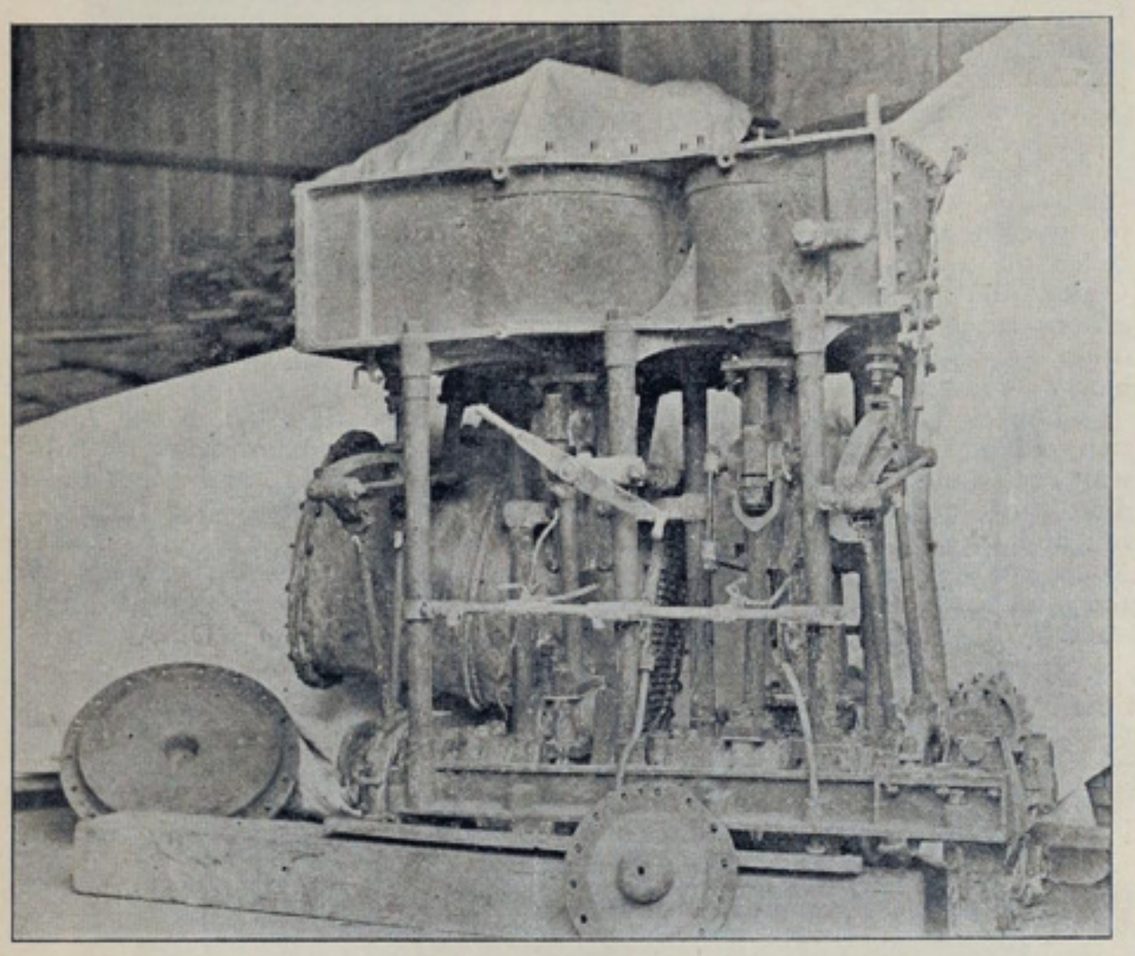
"Although forced draft for increasing the rate of combustion was used in the United States navy during the civil war, it did not come into general use for naval vessels until about 1882, and in the merchant service still later, but since that time its use has become universal. Indeed, were it not for forced draft, boiler weights would be so great as to have long ago set a limit to speeds of the faster classes of vessels. When natural draft alone was used, the maximum rate of combustion with the best free-burning coal and good chimney draft did not reach 20 pounds per square foot of grate. With forced draft in large cylindrical boilers there are now numerous reliable records of 40 pounds per square foot, while in locomotive and water tube boilers 80 pounds is now a common rate, and data have been published of over 100 pounds.

"While the economy of evaporation at these high rates of combustion is not so great as under natural draft, the enormous reduction in boiler weights is very marked. Trials of the boiler of the United States torpedo boat Cushing, for example, show an increase in I.H.P. per ton of boiler of over 50 per cent. when the rate of combustion is increased from 24 to 40 pounds per square foot of grate, which means a decrease in weight per I.H.P. of over 33 per cent. Except on Mr. Howden's part, the question of economy under forcing was for a long time ignored, designers being content with the great gain in power. At the present time, however, the question of economy under forcing is receiving great attention, and we may confidently anticipate this as one of the features of progress in marine engineering."

The necessity for the use of engineer officers of the army in war operations having ended, the war department has reopened the engineer office at Oswego, N. Y., with Capt. G. D. Fitch of the engineer corps in charge. This relieves Major T. W. Symons of Buffalo of the burden of the Oswego district in addition to his own. There will be no change, however, in the headquarters of the tenth light house district. Major Symons will continue to direct engineer affairs of the light house district.

NAVY YARD RELICS OF THE WAR.

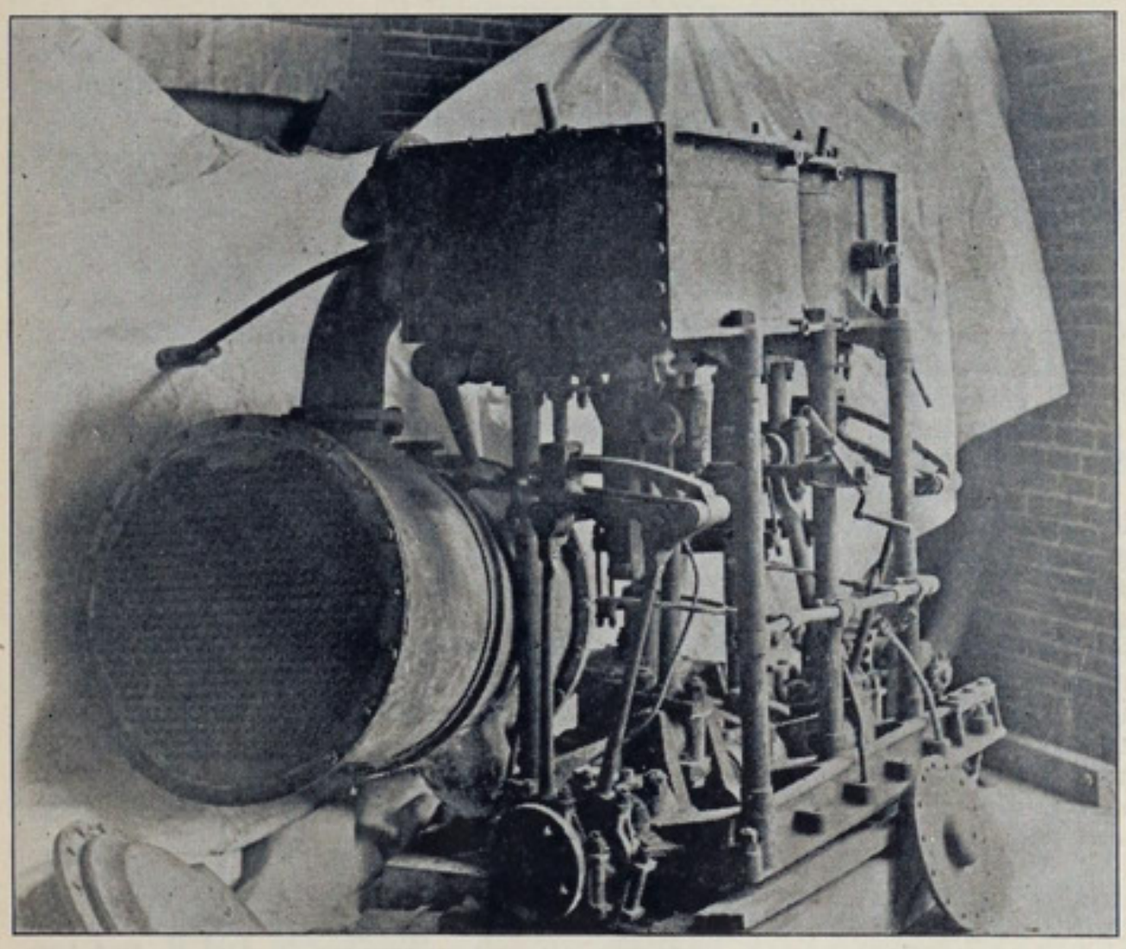
Norfolk, Va., March 1.—Some of the most interesting mementos of the Spanish-American war that have been brought to this country are to be found here at the United States navy yard. Among them is a torpedo boat engine from the Spanish cruiser Maria Teresa, sunk at Santiago and afterward raised, but finally lost on Cat Island while en route to the United States. It will be remembered that the Teresa carried a torpedo boat on deck and it was to this that the engine, of which two views are herewith presented, belonged. The engine was badly rusted and sustained, together with the boiler, which may be seen in both pictures, severe damage from the flames. Workmen at the navy yard



TORPEDO BOAT ENGINE FROM SPANISH CRUISER MARIA TERESA.

have been busy for some little time thoroughly overhauling and practically reconstructing the engine, which will be shipped, as soon as it is in working order, to the naval academy at Annapolis. Other very interesting machinery now at the Norfolk yard, and of which similar disposition will be made, is the engine and boiler from the launch of the Spanish cruiser Colon. It is expected that both engines will be ready for shipment to Annapolis within a few weeks.

Chief Engineer John A. B. Smith, who is at the head of the engineering department at the Norfolk navy yard, has been made the re-



TORPEDO BOAT ENGINE NOW AT NORFOLK NAVY YARD.

cipient of many other donations of relics and curiosities of the war quite as interesting as those mentioned. One of these is a pump recovered from the Maria Teresa after she went ashore on Cat Island, and which was one of the last things to be removed from the vessel. A number of mines picked up in Cuban waters have also been sent to Commander Smith. There are numerous mementos of a different character scattered about the yard, includin several of the larger guns from the Teresa. TheNorfolk navy yard has all the work that can possibly be handled with its present facilities. Commandant Farquhar, in conversation recently with a correspondent of the Marine Review, said that it was even difficult to secure a sufficient number of workmen. Coppersmiths are especially scarce. The work at present in hand includes repairs on the monitors Puritan and Terror, gunboat Montgomery, cruiser San Francisco, auxiliary yacht Vixen and auxiliary cruiser Yosemite, in addition to one of the naval tugs, a large number of colliers and a water barge, all of which are being thoroughly overhauled.

CHANGES IN STEAMBOAT INSPECTION RULES.

A lengthy circular dealing with changes made in the general rules and regulations of the steamboat inspection service at the recent annual meeting of the supervising inspectors in Washington will be distributed in a few days among the local inspectors. The pilot rules for the Atlantic and Pacific coast inland waters were amended by adding thereto a paragraph forbidding the use of cross signals. This rule now reads as follows: "If, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle; and, if the vessels shall have approached within half a mile of each other, both shall be immediately slowed to a speed barely sufficient for steerageway until the proper signals are given, answered, and understood, or until the vessels shall have passed each other. Vessels approaching each other from opposite directions are forbidden to use what has become technically known among pilots as 'cross signals'—that is, answering one whistle with two, and answering two whistles with one. In all cases, and under all circumstances, a pilot receiving either of the whistle signals provided in the rules, which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, must at once observe the provisions of this rule."

As already noted in these columns, the board now says very clearly that second-class pilots (second mates) on steamers of the great lakes may be authorized to act in charge of a watch. In other words, where there is only one first-class pilot with the captain, who is also a first-class pilot, a second-class pilot (or second mate, so called) may take charge of the deck. The rule covering this matter is as follows: "Second-class pilots may be allowed to take charge of steamers not exceeding 100 tons burden and may be authorized by the license granted to act in charge of a watch as assistant to a first-class pilot on passenger, freight and towing steamers of all tonnage."

The new regulations regarding the licensing of masters and mates of sail vessels, which go into effect July 1 next, are included in the circular, and the paragraph in the old rules relating to color blindness is rewritten in this way: "No original license as master or mate of ocean or coastwise steamers, pilot of steam vessels, or as master or chief mate of sail vessels, shall be granted, except on the official certificate of a surgeon of the marine hospital service that the applicant is free from the defect known as color blindness. No renewal of license shall be granted to any officer of the classes named who has not been previously examined and passed for color blindness."

Inspectors of boilers will find quite a few changes in the technical part of rules pertaining to their work. One new paragraph provides that no cast-iron nozzles, branch pipes, or elbows shall be used in connecting steam drums, superheaters, branch pipes or steam pipes to boilers, and no cast-iron flanges will be allowed to be used on boilers for marine purposes unless such cast iron has been officially tested and test on record in the office of the local inspectors where boiler with such appliances was constructed, and no cast iron with a tensile strength of less than 30,000 pounds will be permitted to be used for such purposes.

Another new paragraph in the boiler regulations is as follows: "The diameter of rivets, rivet holes, distance between centers of rivets and distance from centers of rivers to edge of lap for different thicknesses of plates for single and double riveting shall be determined by the rules of the British board of trade." This rule takes effect July 1 next, and the board furnishes formulas, tables and diagrams taken from rules of the British board of trade.

It was also agreed that hereafter river steamers and steamers of less than 100 gross tons will be required to have their steam whistles only two feet above the pilot house, as against the regulation six feet formerly required.

WATER TUBE BOILERS APPROVED BY INSPECTORS.

The board of supervising inspectors of steam vessels, at their recent annual meeting in Washington, approved coil and pipe boilers presented by the following-named persons and firms, when such boilers are constructed in all their parts of wrought iron, steel, or cast steel, in the manner as provided in the general rules of the board: James Carnegie, New York, N. Y. (type B); tug Maytham, Houghton, Mich. (copper fire furnace, special); Peter Cone, Jacksonville, Fla.; A. D. Davis, Yonkers, N. Y.; Detroit Water Tube Boiler Co., Detroit, Mich.; F. W. Edwards, Bayonne, N. J.; Benjamin P. Emery, Kennebunkport, Me.; F. G. Gibson, Dorchester, Mass.; Henry E. Hull, Clinton, Conn.; J. H. King, Daytona, Fla.; J. W. McQueen, Detroit, Mich.; Edward J. Moore, Philadelphia, Pa.; Jacob Ruf, Newark, N. J.; T. W. Rucker, St. Louis, Mo.; Gas Engine & Power Co., and Chas. L. Seabury & Co., consolidated, New York, N. Y. (Kanawha type); Robert White, Brooklyn, N Y.; Samuel T. Williams, Baltimore, Md. (modification of boiler approved in 1894); Beder Wood, Moline, Ill.

Probably no firm engaged in the manufacture of life rafts, life preservers and life boats ever had on hand at one time as many commissions as Thomas Drien & Son, Wilmington, Del. The orders which they are now filling include the provision of an equipment of six 26-foot steel life boats, three ocean life rafts and 300 cork life preservers for each of the new Ward line steamers Havana and Mexico; for the U. S. transport Rita, four 24-foot steel life boats; Plant line steamer Olivette, eight 22-foot steel life boats, two ocean life rafts; American Mail steamship Co., steamers Admiral Sampson, Admiral Dewey, Admiral Farragut and Admiral Schley, sixteen 22-foot patent beaded steel life boats, eight sea life rafts, 516 cork life preservers and sixteen cork life ring buoys; Merchant & Miners Trans. Co. steamers Kershaw and Nantucket, six 24-foot steel life boats, two 24-foot square stern life boats, two 20-foot square stern life boats, two ocean life rafts and 360 cork life preservers; also for the four new Morgan line ships eight 24-foot steel life boats, four 24-foot wooden life boats, four 18-foot wooden life boats; for freight barges building by New England Co., five 20-foot steel life boats; four ocean tugs, building by same company, twelve 20-foot, 18-foot and 16-foot steel life boats.

TWO PENNSYLVANIAS—LAKE SHIP YARD MATTERS.

It is a strange coincidence that two new vessels, one in Detroit and the other in Cleveland, launched on the same day, Saturday last, should bear the same name. A large steel freight steamer for the National Steamship Co. of Duluth, of which Mr. A. B. Wolvin is president and manager, was launched at the Lorain yard of the Cleveland Ship Building Co. and was given the name Pennsylvania. The same name was given to a steel side-wheel passenger steamer, launched about the same hour at the Wyandotte yard of the Detroit Dry Dock Co. Stockholders of the National Steamship Co. are largely the same as those of the Zenith Transit Co., controlling other vessels of the Wolvin fleet, but there is enough difference to necessitate a change of corporation. The Pennsylvania is a very large freight carrier, but she is not a duplicate of the second vessel, the Texas, building at Lorain for Mr. Wolvin and his associates. The Texas will be some 24 feet longer than the Pennsylvania and will undoubtedly carry a larger load than any steamer on the lakes. She will be no larger than the Rockefeller ships of the Morse type, but her load will certainly exceed 8,000 net tons. The Pennsylvania is 430 feet keel, 450 feet over all, 50 feet beam and 28½ feet depth of hold. She will be fitted with triple expansion engines having cylinders of 17, 25½, 38 and 60 inches by 48 inches stroke. There are two Babcock & Wilcox water tube boilers built for a working pressure of 250 pounds per square inch. This steamer will be ready to go into commission April 15, but the other vessel, the Texas, will not be completed until October.

The side-wheel passenger steamer Pennsylvania, launched at the Wyandotte yard of the Detroit Dry Dock Co., is to open up a new service about June 1 between Erie and Buffalo. Her runs will be of the daylight excursion kind. She will be a neat, speedy vessel, well suited to the short runs on which she will be engaged. Her dimensions are 225 feet length, 32 feet beam on deck, 55 feet over guards and 12 feet depth. This vessel will be owned by the Erie & Buffalo Steamboat Co., the officers of which are: Louis Streuber, Erie, president; Eugene McFall, Detroit, vice president; Ed Heuer, Erie, secretary, and William McFall, Detroit, treasurer and purser.

It is announced that the American Steel Barge Co. will undertake at their own works in West Superior, Wis., the construction of big quadruple expansion engines for the steamer which they are to have built on the opening of navigation for the Bessemer Steamship Co. of Cleveland, and which is to be 10 feet longer than that company's steamer Morse. Boilers for this vessel—Scotch type—will be built by the Cleveland Ship Building Co.

FUEL BILLS ON LAKE STEAMERS.

It is the custom of the Cleveland-Cliffs Iron Co. of Cleveland to award money prizes to engineers of the company's steam vessels whose fuel bills are the lowest. The prizes are based on the cost of fuel per mile. The engineers are each presented with a statement at the end of the year showing these costs, and in event of any changes in boilers or engines that would reduce cost, allowance is made for such changes. This year the prizes were earned by E. I. Jenkins of the steamer Pioneer and E. V. Barry of Frontenac, $100 and $75 respectivelv.

The comparative statement of fuel bills, which is presented on this page, will prove interesting as showing this item of cost in the operation of lake steamers. It will be understood, of course, that the five steamers named in the table are not of the 6,000-ton, quadruple-expansion engine type that are now building generally for the lake trade. These steamers are, in fact, only of the medium class, and do not move large cargoes on the low fuel cost claimed for the modern ore freighters.

COST OF FUEL PER MILE RUN, 1897 AND 1898—CLEVELAND-CLIFFS IRON CO.'S STEAMERS.

	1897.									1898.								
Name of Vessel.	No. of Trips.	No. cargoes	Name of Engineer.	Miles.		Fuel Used.				No. Trips.	No. cargoes	Miles.		Fuel Used.			Cost per Mile.	
				Run.	Per Hour.	Total Tons.	Total Cost.	Cost per mile.				Run.	Per Hour.	Total Tons.	Total Cost.	Cost per mile	In-creased.	De-creased.
Pioneer	25	29	E. I. Jenkins	29,837	11.88	2318	$4,257.05	$.1427		33	33	41,009	12 12	2,721	$4,862.35	$.1186		$.0241
Frontenac	26	27	E. V. Barry	32,555	10.91	2720	5,675.50	.1743		30	30	38,612	11.08	2.959	6,137.75	.1589		.0154
Cadillac	26	30	Thomas J. Rees	31,530	10.24	1659	3,469.40	.1100		26	28	32,866	10.05	1,783	3.669.05	.1116	$.0016	
Kali uga	17	17	Chas. Stoeber	22.135	8.24	1940	4,021.90	.1817		21	22	28,351	8.24	2,632	5.340.50	.1884	.0067	
Pontiac	26	30	Geo. Waterbury	35,083	11.91	3351	6,987.80	.1992		32	33	41,176	12.43	4,111	8,517.10	.2068	.0076	

Universal regret is felt in eastern shipping circles because of the death of John Driscoll, superintendent of the New Jersey Dry Dock & Transportation Co. at Elizabethport, N. J. Mr. John T. Kirk, formerly general manager of the Allison Dry Dock Co., has assumed charge of the yard of the New Jersey company.

The Massachusetts Institute of Technology, Boston, Mass., has just issued a pamphlet setting forth in a very comprehensive manner the scope of the department of naval architecture, which is in charge of Prof. Cecil H. Peabody. The schedule of the course is given in full and there is much other information relative to the course of study.

Capt. James MacKenzie, ship master and vessel owner of Buffalo, who died in that city a few days ago, was highly respected among associates in the lake region. His last command, some ten years ago, was the light house tender Haze. He had accumulated sufficient money to live in comfort after he had quit sailing.

De Grauw, Aymar & Co., lately incorporated with F. S. De Grauw president, Frederick S. Aymar, vice-president, and Geo. A. Boyden secretary, have begun business at 14 Coenties slip, New York. Messrs. De Grauw and Boyden were for several years employed by De Grauw, Aymar & Co. of 34 South street, New York. The new concern will conduct a general ship chandlery business, but not provisions.

APPOINTMENTS OF CAPTAINS AND ENGINEERS.

Buckeye Steamship Co., C. L. Hutchinson, Mngr., Cleveland: Steamer—CITY OF GLASGOW, Capt. John McNeff, Engineer C. R. Price.

Hutchinson, J. T., Cleveland: Steamers—GERMANIC, Capt. M. H. Place, Engineer J. S. Thome; RUBE RICHARDS, Capt. Robert Kerr, Engineer J. C. Johnson; QUEEN OF THE WEST, Capt. C. J. De Beau, Engineer Geo. Blauvelt. Schooners—E. C. HUTCHINSON, Capt. T. K. Woodward; MAY RICHARDS, Capt. John Martin.

Union Steamboat Co., Buffalo: Steamers—STARRUCCA, Master Walter Robinson, Engineer, A.A. Brown; RAMAPO, Master Jno. H. McDonald, Engineer Henry C. Jordan; CHEMUNG, Master F. B. Huyck, Engineer George Fritsche; OWEGO, Master John Byrne, Engineer Reynolds Hill; TIOGA, Master John Wulke, Engineer Albert Simpson; H. J. JEWETT, Master John Dugan, Engineer Charles Coushaine; ROCHESTER, Master George T. Morris, Engineer Nelson Johnson; NEW YORK, Master O'Neil, Engineer John Caul.

Union Transit Co., H. C. French, Mngr., Buffalo: Steamers—J. M. NICOL, Capt. Wm. McLean; W. H. STEVENS, Capt. Alex. Clark; AVON, Capt. Norman McGuire; EBER WARD, Capt. John L. McIntosh; JAMES FISK, JR., Capt. John Pearson; PORTAGE, Capt. John Tyrney.

Lehigh Valley Transportation Co., Buffalo: Steamers—SARANAC, Capt. J. M. Todd; SENECA, Capt. Dennis Driscoll; TUSCARORA, Capt. William Williams; F. P. WILBUR, Capt. P. McFarlane; TACOMA, Capt. ———; CLYDE, Capt. Stephen Lyons; H. E. PACKER, Capt. J. A. Whiteside; FRED MERCUR, Capt. C. E. Fuller. No appointments have been made for the OCEANIC and R. A. PACKER.

Minnesota Steamship Co., Pickands, Mather & Co., Mngrs, Cleveland: Steamers—MANOLA, Capt. A. P. Chambers, Engineer D. A. Black; MARISKA, Capt. F. A. Bailey, Engineer David Burns; MARUBA, Capt. F. J. Crowley, Engineer John Dupont; MATOA, Capt. C. H. Cummings, Engineer W. W. Tyler; MARINA, Capt. J. W. Morgan, Engineer W. A. Meddaugh; MASABA, Capt. A. H. Reed, Engineer A. L. Wilcox; MARITANA, Capt. C. H. Bassett, Engineer Geo. Arnold; MARIPOSA, Capt. H. Zealand, Engineer F. A. Smith; MARICOPA, Capt. F. D. Root, Engineer B. F. McCanna; NEW STEAMER, Capt. G. B. Mallory, Engineer P. J. June. Schooners—MALTA, Capt. John Nahrstedt; MARCIA, Capt. A. G. Toppan; MANDA, Capt. W. E. Chilson; MARTHA, Capt. E. A. Hill; MAGNA, Capt. H. Culp; MAIDA, Capt. M. K. Chamberlain; MAID, Capt. John Collins; NEW SCHOONER, Capt. A. J. Talbot.

American Steel Barge Co., Pickands, Mather & Co., Agents, Cleveland: Steamers—COLGATE HOYT, Capt. Neil Campbell, Engineer Gilbert Patterson; J. L. COLBY, Capt. C. D. Secord, Engineer William Densmore; E. B. BARTLETT, Capt. M. C. Cameron, Engineer J. J. Norcross; A. D. THOMSON, Capt. E. L. Sawyer, Engineer John McLaughlin; THOS. WILSON, Capt. Robert Jones, Engineer A. J. Smith; SAMUEL MATHER, Capt. John Parke, Engineer A. McKenzie; JAS. B. COLGATE, Capt. Chas. J. Grant, Engineer Herman Folkert; JOHN B. TREVOR, Capt. John Dunn, Engineer Walter Harsant; F. ROCKEFELLER, Capt. M. A. Boyce, Engineer J. H. Pierce; A. McDOUGALL, Capt. W. H. Kilby, Engineer Irwin Marshall. Barge captains in this fleet, not assigned to any particular vessel, are:—R. W. Gleason, Willard Damon, H. Harris, Jr., A. A. Boyce, C. H. Noble, Robt. Thompson, Samuel Durfey, Louis Leonard, Robt. Brooks, E. Emanuelson, James Burr, J. W. Norcross, Ed. Morey, D. McFadgen, A. G. McLeod, John Sprowell, Chas. Mulholland, Geo. Gallant, A. Siljander, W. H. Dick.

Interlake Co., Pickands, Mather & Co., Mngrs., Cleveland: Steamers—KEARSARGE, Capt. Robert McDowell, Engineer L. H. Sebastian; VICTORY, Capt. Fred. Hoffman, Engineer Thos. Treleaven. Schooner—CONSTITUTION, Capt. William Holly.

Huron Barge Co., Pickands, Mather & Co., Mngrs, Cleveland: Steamer—PATHFINDER, Capt. D. H. Mallory, Engineer C. A. Heisner. Schooner—SAGAMORE, Capt. C. C. Joiner.

Pickands, Mather & Co., Cleveland: Steamer—CLARENCE A. BLACK, Capt. W. B. McGregor, Engineer John Hegemer.

A paper on the "Rise and Fall of the American Merchant Marine" was read by Joseph R. Oldham at the semi-monthly meeting of the Civil Engineers' Club of Cleveland on Tuesday last.

Ten days stop-over at Washington.—Tickets to Philadelphia and New York over Pennsylvania short lines may be obtained via Washington, and good for a ten days' visit at the national capital, at the same fare as apply to Philadelphia and New York over direct lines of Pennsylvania system. For further particulars apply to Pennsylvania lines ticket agents or address C. L. Kimball, passenger agent, Cleveland, O.

WANTED—To charter for two years—Small tug or steam launch. Must make at least 15 miles an hour. Major Sears, Duluth, Minn.

March 9.

RISE OF GERMAN MARITIME INTERESTS.

SHIP BUILDING GROWTH OF THE EMPIRE—POSTAL SUBSIDIES COMPARED WITH THOSE OF GREAT BRITAIN.

The ship building growth of Germany is dealt with quite largely in a report on the development of commercial, industrial, maritime and traffic interests of the German Empire, recently prepared by Mr. Gastrell, the British commercial attache at Berlin. An extract from the report follows:

"Among the many directions in which the German Empire has been pushing its economic expansion as a powerful European state in recent years, none is more remarkable than the line of development of its maritime interests in the broad sense of the term, which includes ship building carrying power, and over-sea commerce, together with its necessary protection as represented by a navy. Sea interests and sea power are the natural corollaries of trade interests and industrial power, and they today take a leading place in German politics, whereas up to quite recent times they were of quite secondary importance to politicians and still less to the nation at large. It is, however, only since 1881 that, moved by national considerations, the German government decided to foster the growth of ship building; but the intention to do so did not take practical shape until the first subsidy bill of 1885. By this action they afforded material support to the colonial and commercial aspirations of the empire. Though the principle then laid down has since been extended, it is almost entirely due to the energy of private individuals that such a high level of efficiency in this direction has been attained that, at the present time, the German ship building yards have been offered more orders than they can possibly carry out.

"There are now being constructed for the Hamburg-American Co. fourteen new large ships of 144,980 tons, and a further nine of a tonnage of 78,380 tons are building for the North German Lloyd. Together, therefore, the immense total of 223,360 tons of ship building are now being built for these two companies, of which all but four ships of 34,360 tons are laid down in German yards. And it is not only magnificent merchant shipping that has been and is being constructed, but also large numbers of men-of-war, both for the German navy and for foreign nations. In 1897 as many as eight were launched.

"The German government has not, however, largely subsidized or assisted the construction of ships, as has been the case in other countries. They have merely followed out their usual policy of affording a very moderate amount of protection to the young or struggling home industry, in order to enable it to have a fair chance of successfully competing with already existing foreign competitors. The most important form of subsidy is by postal contracts for mail services, by quick steamers, though it is frankly acknowledged that other important objects are kept in view throughout, such as the indirect advantages that would accrue to German trade, the gain to the empire by the increase of the material for forming an efficient naval reserve, the utilization of the fast steamers as cruisers in time of war, and last, but not least, the coveted means of favoring home industries. Conformity with admiralty requirements, the use of German materials and products as far as possible (including coal), and the construction of the new vessels in the ship building yards of the empire are among the chief conditions of the contract. These subsidies, which are only enjoyed by two steamship lines, the North German Lloyd and the East African line, amount at the present time to £324,500 a year for direct postal subsidies, and to £19,250 for separate payments for carriage of mail bags, chiefly to North America by lines other than the two above mentioned. The total expenditure is, therefore, £343,750 a year in Germany, whereas the similar postal subsidies paid to British companies amount to £653,276 this year, and the sum expended by Her Majesty's government for the right to use certain fast steamers as cruisers, in case of naval warfare, amounts to an additional £48,600 yearly. No such payments are made by the German government to any of their lines of steamers, even when the ships are built on admiralty lines. But they can be requisitioned under the law of June 13, 1873, for war purposes. To other German shipping companies, of which there are many, nothing is paid to assist their development; but they may occasionally receive payment for single mail bags carried out of the above mentioned small sum."

FINE COASTING STEAMER.

The Harlan & Hollingsworth Co. of Wilmington, Del., have just contracted with the Boston & Philadelphia Steamship Co. to build, under American Shipmasters rules, a freight and passenger steamer to ply between Philadelphia and Boston. Dimensions of the vessel will be: Length of keel, 265 feet; length over all, 290 feet; beam, moulded, 42 feet; depth, moulded, at center to hurricane deck, 36 feet, and of about 2,500 tons burden. Engines will be of the inverted triple expansion type with cylinders of 25, 41½ and 68 inches by 42 inches stroke. There will be four boilers of Scotch type, 12 feet diameter by 10½ feet long, built for a working pressure of 170 pounds per square inch. The ship is to show a speed of 15¾ knots on trial, light, with ballast tanks filled. She is to be fully equipped with all modern appliances, the captain's room being fitted in mahogany throughout, with smoking room and dining rooms also of mahogany. There will be large stateroom accommodations, electric lights, telegraph, speaking and sounding tubes and Ellis & Eaves induced draft. This is the fourth vessel to be built by the Harlan & Hollingsworth Co. for the Boston & Philadelphia Steamship Co. Construction of this ship will be under the supervision of Mr. C. W. Wiley.

Notwithstanding the bad weather of the last two weeks and the delay resultant thereto, work is progressing rapidly in the Harlan & Hollingsworth Co.'s yards. The keel plates have been laid for the torpedo boat destroyer Hull and those of the Hopkins will be laid down this week. The steamer Ponce, building for Miller, Bull & Knowlton, New York, is going along rapidly. Her water bottom floors are nearly all up and the workmen will shortly start in on her frames. The keel has also been laid for the Red D Line ship Maracaibo. Both the latter ships are being built under the supervison of Mr. John Haug. The steamer Kershaw will shortly be ready for her trial trip, and her sister ship, the Nantucket (both being built for the Merchants' & Miners' Transportation Co.), will go into the water early next month.

NEW BALTIMORE SHIP YARD.

PROPOSITION FOR THE ESTABLISHMENT OF A LARGE ONE ON CHESAPEAKE BAY BY HENRY G. MORSE AND OTHERS—SHIP BUILDING CONTRACTS ALL OVER THE COUNTRY.

A proposition for the establishment of another mammoth ship building plant on the Atlantic coast, and at the head of which is Mr. Henry G. Morse, formerly president of the Harlan & Hollingsworth Co., Wilmington, Del., has been talked of in Baltimore but has not as yet assumed definite shape. In the representations made in a semi-official manner it has been stated that the plant would employ in the neighborhood of 5,000 men with a pay roll aggregating about $7,500 daily. The proposed capitalization of the company is $3,000,000, although it is stated that should it meet with success anticipated dry docks would be constructed and the capacity of the plant doubled, the total outlay eventually to aggregate in the neighborhood of $6,000,000. It is understood that the location of the plant will be determined largely by the ability of the city selected to raise the requisite $1,500,000—or in other words half the proposed capitalization—by subscriptions to stock. According to press reports upwards of $1,000,000 has now been subscribed in the city of Baltimore, and should subscribers manifest a willingness to make good their promises there can be little doubt that the plant, if the project goes through, will be established in the vicinity of that port. Sites at Canton and Curtis Bay are most prominently mentioned among those in the vicinity of Baltimore. Among the Baltimorians whose names have been associated with the enterprise are John K. Cowen, Nelson Perin, Jenkins Brothers, Harry Walters, Henry A. Parr and the firm of Robert Garrett & Sons.

The steel sailing ship Arthur Sewall was launched a few days ago at the Sewall yard, Bath, Me. She is 340 feet over all, 320 feet keel, 45 feet beam, 25 feet 9 inches depth and of 3,225 gross tons burden. She carries four masts, 184 feet long, and will spread about 12,000 feet of canvas. It is claimed that this vessel, which is the ninty-seventh launched by the Sewall firm, is the most finely finished and furnished sailing vessel afloat.

Work is being pushed on the Jefferson, the second of the Old Dominion steamers under construction at the Roach yard, Chester, Pa. She is well plated and the decking is in preparation.

William Bates of Santa Barbara, Cal., has begun work on a new yacht which is expected to prove especially speedy.

John Bishop of Vincent Point, Mass., has begun work on a schooner for Capt. Charles H. Harty.

J. J. Wardwell, master builder for H. M. Bean, Camden, Me., ship builder, has just completed a set of moulds and plans for a vessel to be built at Belfast, Me.

YACHT FOR MR. MORTON F. PLANT.

Mr. Morton F. Plant, second vice-president of the Plant system lately purchased from John D. Barratt of Johnson & Higgins, New York, the steel schooner yacht Ingomar. The Ingomar is a new 90-foot vessel and is speedy and commodious. She left Boston Jan. 21 and has just passed Key West, Fla. She has been kept busy dodging the continued winter storms which have, of course, been unprecedented in fury during her trips down the coast. The Ingomar was built at the yard of the George Lawley & Son, corporation, East Boston, Mass. Mr. Plant is having the yacht brought to Tampa with the idea of spending some six weeks in cruising around Cuba, Porto Rico and Jamaica.

The Plant service is now in full operation on even a more extensive scale than previous to the war. The vessels now running regularly from Port Tampa include the Plant mail steamer Olivette, recently rebuilt, the Plant liner Florida, the chartered Morgan line steamer Whitney and the chartered British steamer Yarmouth. The Plant people are also operating the river steamers Margaret, Clara, Lawrence and Tarpon from Port Tampa. The Plant liner Mascotte is now at Cramp's ship yard, Philadelphia, and will be entirely rebuilt.

The United States government is now engaged in extensive shipping operations between Port Tampa and West Indian ports. The transport Minnewaska, draught 22 feet, left a few days ago with troops, artillery, stores, water and horses for Havana, Matanzas and Santiago. An increasing number of British and German vessels are calling at the port for cargoes of phosphate. It is expected that the government appropriation for deepening Port Tampa harbor from 22 to 27 feet will be of considerable benefit to the commerce of the port. Mr. J. Stewart Thomson, secretary to the second vice-president of the Plant system, in a recent letter to the Review from Tampa states that the excursion steamers of the Plant system on Tampa bay and up the Manatee river are doing an excellent business.

Referring to the trials of the British first-class gunboat Sheldrake, which has just been commissioned, the London Globe says: "The Sheldrake is a vessel whose future career will be watched with great interest by naval engineers, as she is the only ship in the service that is fitted with Babcock & Wilcox's patent water tube boilers. She has been subjected by the Admiralty to the severest series of trials, which she passed through triumphantly. After various basin and economy trials, she was taken to sea and tested at full power. Her boilers are four in number, with an aggregate grate surface of 252 square feet. The average pressure of steam was 151 pounds, and the pressure of the air supplied to the fires was only half an inch of water. During this trial the average indicated horse power was 4,050, the revolutions were 280, the coal consumed per indicated horse power per hour was 1.57 pounds, and the average speed 20.6 knots. Considering that her original forced draft power was 3,500 and her extreme speed 19 knots, this must be looked upon as an immense success."

A visit to the national capital may be enjoyed without extra cost for fare in going to Philadelphia and New York over Pennsylvania short lines. Tickets to those points via Washington may be obtained at same fares as apply over Pennsylvania direct lines, and will be good for ten days' sojourn at the national capital. For particular information apply to Pennsylvania lines ticket agents or address C. L. Kimball, assistant general passenger agent, Cleveland.

TRADE NOTES.

H. F. Dagwell has laid the keel at Indian River, Mich., for a small wooden passenger steamer—70 feet long and to be supplied with a 10 by 10-inch engine.

A fore-and-aft compound engine, a marine fire-box boiler and a steam steerer, taken from the wrecked steamer H. A. Tuttle, are advertised for sale elsewhere in this issue by E. G. Crosby & Co., of Muskegon, Mich.

The Falls Hollow Staybolt Co. of Cuyahoga Falls, O., has just received a large order from the W. & A. Fletcher Co., of Hoboken, N. J., for safety hollow staybolts, made from the best quality of steel, to be used on a government contract. The Falls company is in position to fill orders promptly for its product, made from either steel or charcoal iron.

Charles Longstreth, vice-president of the United States Metallic Packing Co., Philadelphia, and Albert J. Zwart, western agent of the company, who is located at 1003 Marquette building, Chicago, have been calling on vessel owners in lake cities during the past, especially such of them as are building new steamers that will be using steam at high pressures. With high pressure steam, metallic packing is required, and the Philadelphia company is enjoying a very large trade in marine lines of late on account of the general tendency towards quadruple expansion engines and in many cases water tube boilers.

The Sheriffs Manufacturing company, Milwaukee, Wis., has orders for Sheriffs wheels as follows: One of 11 feet diameter for steamer F. & P. M. No. 5; one of 7 feet 8 inches diameter for the Dunham tug J. C. Evans, under charter to the Flint & Pere Marquette Ry. Co. at Ludington; one of 8 feet diameter for the tug John Gregory at Cleveland; one of 6 feet 10 inches diameter for the tug Fred A. Lee at Sault Ste. Marie. Wheels of 4 feet 8 inches and 4 feet 9 inches diameter, respectively, have also been shipped to New Orleans, La., and Stillwater, Minn., within a few days past.

M. T. Davidson, steam pump builder of New York, is also the sole manufacturer of the widely-known Baird evaporators, the patents of which he now owns. For some time past he has been very busy with evaporator work and is now building a number of these machines for the torpedo boats and destroyers in course of construction for the United States government. Mr. Davidson furnished evaporators for more than a dozen naval vessels during the war, and constructed the entire distilling apparatus for the United States distilling ships Iris and Rainbow. More than 200 Baird evaporators are now in actual use in steam yachts and vessels of the United States navy and the merchant marine.—Marine Journal, New York.

U. S. ENGINEER OFFICE, Vicksburg, Miss., March 2, 1899. Sealed proposals for excavating 7,500,000 cubic yards of earth, more or less, along route for diverting mouth of Yazoo River, near Vicksburg, Miss., under continuous contract, will be received here until 3 o'clock, p. m., April 5, 1899. Information furnished on application.

J. H. WILLARD, Maj. Eng'rs. Mar. 23.

SEALED proposals will be received at the office of the Light-House Engineer, Baltimore, Md., until 12 o'clock, M., MARCH 15, 1899, and then opened, for furnishing the material and labor of all kinds necessary for the erection and delivery of the Hooper Island Light-House, Md., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to W. A. Jones, Lieut. Colonel, U. S. A.

—March 2.

SEALED proposals will be received at the office of the Light-House Engineer, Baltimore, Md., until 12 o'clock, M., MARCH 15, 1899, and then opened, for furnishing the material and labor of all kinds necessary for the completion and delivery of the metal work for Hooper Island Light-House, Md., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to W. A. Jones, Lieut. Colonel, U. S. A. —March 2.

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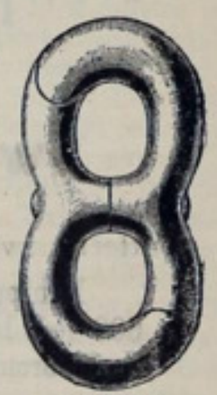
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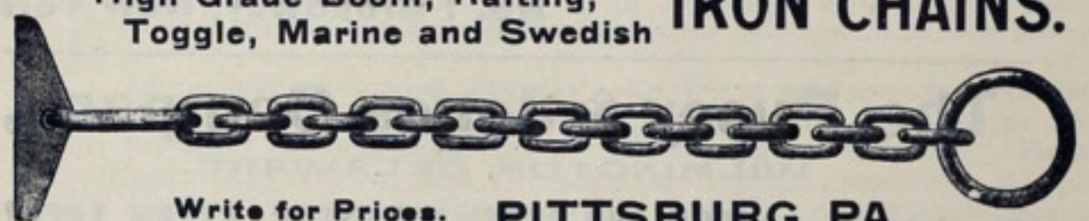

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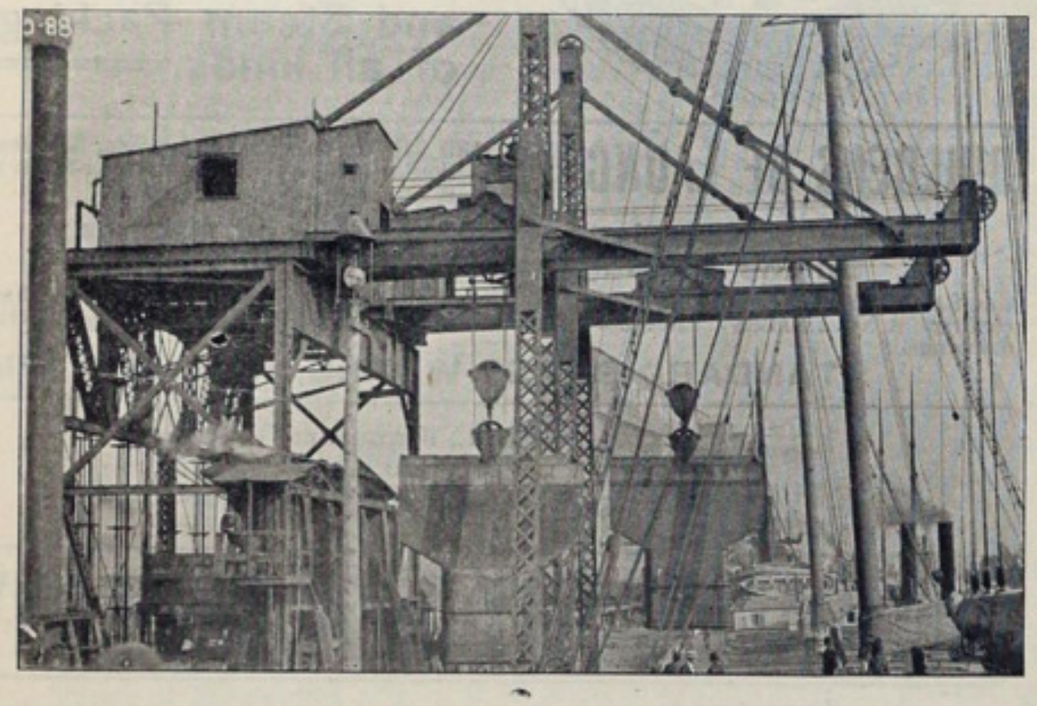

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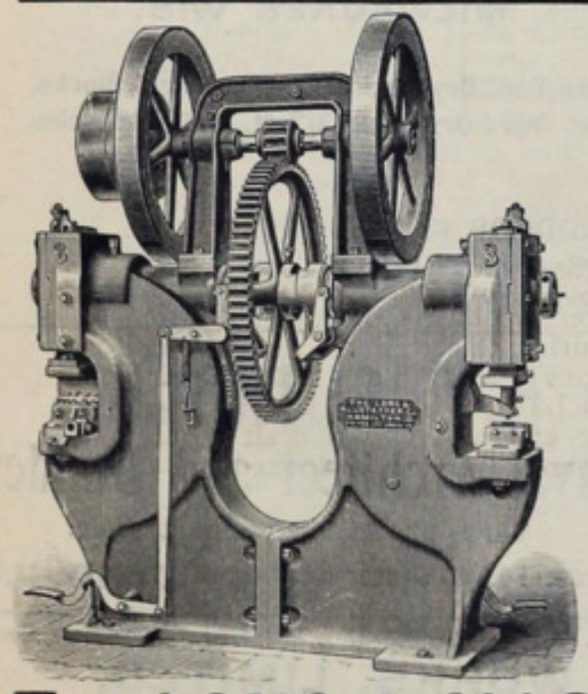

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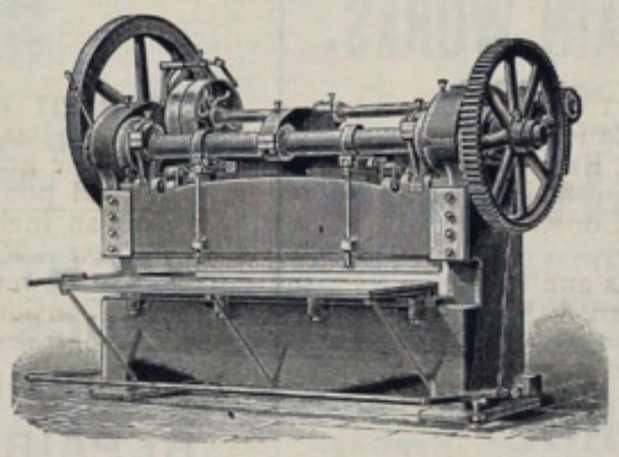

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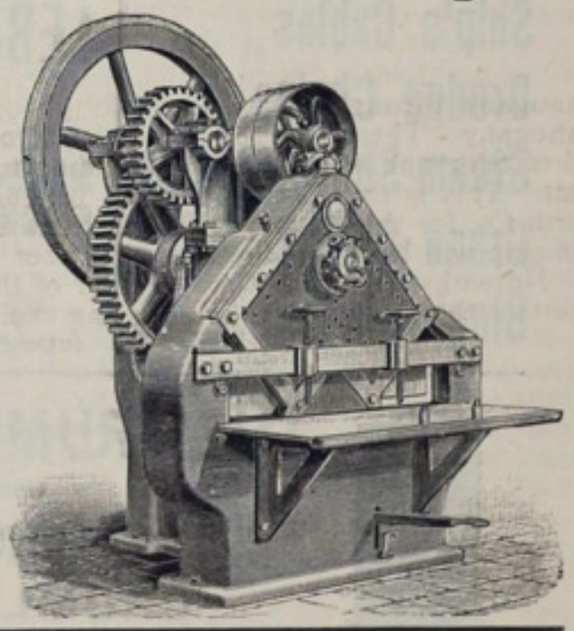

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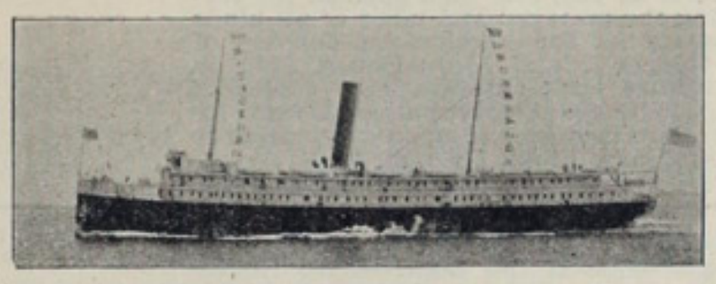

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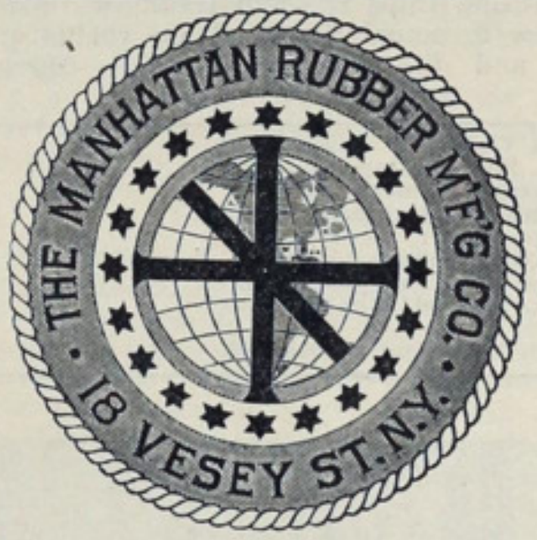

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